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Impact of Special Economic Zones on
Employment, Poverty and
Human Development

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Foreword

The number of Special Economic Zones (SEZs) globally continues to expand. SEZs account for an increasing share of international trade flows and employ a growing number of workers world-wide. In the global economy, EPZs are viewed as an important if a second best policy instrument to promote industrialisation, generate employment, and for regional development. However, costs and benefits of SEZs have generated an intense debate, touching on almost every possible aspect of SEZs. Therefore, whether SEZs are beneficial for development remains a subject of controversy. The present study has focused on one aspect of this debate, namely the human development effects of SEZs. This is a relatively under-researched theme. Although labour standards, labour relations and employment effects have been the most critical and controversial elements of SEZs, a comprehensive analysis on these aspects is scarce in the Indian context.

The new SEZ policy has triggered a wide ranging debate in India. In view of this ongoing debate, this paper is timely and will contribute to a better understanding of the employment and human dimensions of SEZs. It is therefore my hope that this study, based on empirical work, will help move the debate forward.



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May 16, 2007

Abstract

This study aims at examining the impact of Special Economic Zones (SEZs) on human development and poverty reduction in India. It identifies three channels through which SEZs address these issues: employment generation, skill formation (human capital development), and technology and knowledge upgradation. It examines how the impact of SEZs is passed through each of these channels. The study finds that the modality differs significantly according to the characteristics of the SEZs, in particular, the level of their development as reflected in the composition of economic activities. Within this framework, the study examines the sectoral and economic composition of SEZ activities in India. It finds that labour intensive, skill intensive and technology intensive firms co exist in India's zones and, therefore argues that all the three effects described above are likely to be important in the Indian context. Empirical findings reported in the study are based on the data collected from both secondary sources and primary surveys. The primary survey based data was generated through extensive interviews of entrepreneurs and workers across the three largest SEZs (in terms of their contribution to exports and employment) : SEEPZ, Madras and Noida. The analysis reveals that 'employment generation' has been the most important channel through which SEZs lend themselves to human development concerns, in India. Employment generated by zones is remunerative. Wage rates are not lower than those prevailing outside the zones. Besides, working conditions, non monetary benefits (such as transport, health and food facilities), incentive packages and social security systems are better than those prevailing outside the zones, in particular, in the small/informal sector. The role of SEZs in human capital formation and technology upgradation is found to be rather limited. The study argues that the zones' potential could not be exploited fully in India. This could primarily be attributed to the limited success of SEZs in attracting investment and promoting exports. The new SEZ policy gives a major thrust to SEZs. However the creation of SEZs alone does not ensure the realization of their potential. The government will need to play a more proactive role for effective realization of the full range of benefits from SEZs.

JEL Classification: F16, J31, J32, O15, O32

Key Words: Special Economic Zones, Human Development, Employment, Poverty, Skill Formation, Technology Transfers, Local R&D

1. Introduction

In this era of globalization, most developing countries are witnessing a shift away from an import substitution based development strategy to one based on export promotion policy. As part of their policy instruments to promote exports, many of these countries are vigorously promoting export processing zones (EPZs). EPZs are seen as a key instrument not only for promoting exports and earning foreign exchange but also for stimulating economic growth through additional investment, technology transfers, and employment generation. There were 176 such zones across 47 countries in 1986. In 2003 the number of zones increased to over 3000 across 116 countries (ILO 2003). A majority of new zones have taken root in developing countries.

Despite the current hype over EPZs in developing countries, controversies regarding the beneficial effects of EPZs onto the economy that have been raging for more than four decades now, have not subsided. One of the most controversial aspects of EPZs is their impact on labour standards, labour relations and human development. A significant body of literature now exists addressing the concerns about human development effects of these zones. However, empirical evidence is ambiguous. One group of studies (ILO 1998, ICFTU 2004, PRIA 2000, Hossain 2001, Mazumdar 2001, and Kemal 2001, among others) shows that zones are target-oriented workplaces where virtually all indicators of sustainable human development including labour standards, labour laws, human rights, health, and safety and the environment are ignored. Another group of studies argues that EPZs can be instrumental in promoting human development (ILO/ UNCTC 1988; Basile and Germidis 1984, Willmore 1995). Review of existing studies however suggests that a comprehensive analysis of EPZs' labour related effects is scarce.

There are several limitations of the existing literature: First, in the absence of a comprehensive framework within which different aspects of human development effects are woven together, some effects are over emphasized while others are neglected. Second, the analysis is often supported by patchy evidence. As a result, different studies come to different conclusions even where their analysis pertains to the same country. Third, very few studies evaluate the labour effects of EPZs in comparison with domestic industries (Kusago and Tzannatos 1998). Fourth, zones are not a static phenomenon. The economic conditions in which they operate change over time and affect their characteristics (or competitive attributes). This, in turn, impinges on the benefits that they yield. Gains from EPZs would thus depend on the stage of their evolution and would vary across countries as also within countries across zones and time. Finally, few academic studies are available on labour effects of zones in India. Most of the available studies are narrow in scope and are based on case studies instead of broad surveys.

The present study integrates various aspects of human development effects into a single framework and examines the Indian experience within that framework. The research question is whether EPZs have contributed to employment, human development, and poverty reduction in India.

A variety of terms such as industrial free zones and free trade zones are used interchangeably through most of the EPZ literature. These enclaves are referred to as 'special economic zones' in China, 'maquiladoras' in Mexico, Costa Rica and El

Salvador, 'industrial free zones' in Ghana, Cameroon and Jordan, 'special export processing zones' in Philippines and 'free economic zones' in Russia (Armas and Sadni-Jallab 2002). In India, they are called 'special economic zones' (SEZs). The SEZ scheme introduced by the government of India in April 2000 has its genesis in the Export Processing Zone (EPZ) scheme, which was introduced way back in 1965 when the first zone was set up in Kandla. By the late 1990s, seven more zones had come into existence. Under the new scheme, however, all the existing EPZs were converted into SEZs. In the rest of the paper therefore we shall use the term 'special economic zones' or SEZs.

The study is organized into six sections. Section 2 outlines a broad theoretical framework to highlight the channels through which SEZs can promote human development. The framework encompasses not only labour relations and labour standards issues but also knowledge generation and technology management in the zones and their linkages with poverty reduction. Section 3 reviews empirical literature regarding zone effects on various aspects of human development. Section 4 explores the direct impact of SEZs on human development and poverty in India. Section 5 focuses on spill-overs/indirect effects of SEZs. Finally, Section 6 concludes the analysis and makes policy recommendations so that SEZs can be made more responsive to human development needs of the country.

2. Human Development and Poverty Reduction Effects of Zones: An Analytical Framework

Following the existing SEZ literature, we identify three channels through which SEZs may affect human capabilities

- Employment effects
- Human capital formation effects
- Technology upgrading effects

2.1 Employment Effects

The employment effect of SEZs operates through three channels : one, SEZs generate direct employment for skilled and unskilled labour ; two, they also generate indirect employment; and three, they generate employment for women workers. It is believed that employment creation generates incomes, creates non pecuniary benefits, improves the quality of life of labour and enhances their productivity. These, in turn, have poverty reduction effect.

2.1.1 Direct employment generation

In so far as SEZs comprise labour-intensive activities, enterprises in SEZs constitute, a priori, a significant source of new employment. Due to the availability of labour at low wages, developing countries generally attract investment into simple processing labour intensive industries. This increases the demand for unskilled labour within the zone. Shift towards higher value added activities as SEZs grow, might increase demand for skilled labour also. SEZs also generate employment for unskilled labour by creating demand for physical infrastructure within the zone. This stimulates the local construction industry giving employment to unskilled labour. Sivalingam (1994)

reports that in cities surrounding the Malaysian SEZs, there is even labour shortage in this industry. Demand for utilities such as water, electricity, communication, and administration also rises. Finally, there has been increasing demand for various support services such as, hotels and restaurants, and transport, which is expected to have a substantial impact on employment generation.

2.1.2 Indirect employment generation

The indirect effect is manifested as ancillary employment opportunities generated in sectors of the economy affected by the operations of the SEZ. These include, transport, communication, automobile, civil aviation, shipping, tourism, hospitality, packaging, banking, and insurance. Employment opportunities are, thus generated for both unskilled and skilled labour.

In addition to the above, there are three other channels through which SEZs generate a favourable impact on employment generation.

One, SEZs provide foreign exchange earnings that slacken the foreign exchange constraints of the rest of the economy regarding the import needs of the rest of the economy and accelerate investment activities. SEZs thus generate development funds, which facilitate generation of economic activities and employment.

Two, they also generate economic activity outside the zone due to the transformation of investment funds into fixed assets and purchase of inputs and services from the rest of the economy.

Three, once additional incomes are generated, there is an increase in demand for various goods and services such as housing, education, health and transport. This in turn has multiplier effects on income and employment.

2.1.3 Employment for Women

Evidence suggests that women's share to total employment in SEZs is substantially higher than both the economy as a whole as well as the manufacturing sector outside the SEZs (Kusago and Tzannatos 1998). Women workers are considered more disciplined and hard working. It is found that employers prefer female workers to male workers in the belief that manual dexterity, greater discipline and patience make women more suitable for the unskilled and semi-skilled activities carried out in the zones. Besides, they are less likely to exert pressure for high wages and better working conditions. Majority of women are young, single and come from rural and poor backgrounds. But for SEZs they might not have been absorbed into formal employment at all and hence SEZ employment can be said to afford them an independent source of income that would otherwise have been denied. SEZs are thus expected to contribute substantially to the empowerment of women (Madani 1999).

The above theoretical propositions suggest that zones contribute to human development by increasing employment opportunities. The implicit assumption is that job creation alleviates unemployment, generates income, improves standard of living, and results in human development and poverty reduction. However, it cannot be assumed, a priori that employment in SEZs enhances human development, which

depends crucially on wages and working conditions. It is generally claimed that in order to attract investment, in particular FDI, governments of host countries eliminate labour standards, consequently promoting labour exploitation and depletion of human capital. There are restrictions on the right to join a trade union, bans on collective bargaining and the right to strike. Employers often pay scant regard to labour laws, employment regulations, and health and safety norms at work. The literature is replete with studies on this issue the findings of which are, however, ambiguous. These issues are critical in determining employment effects of zones on living standards, poverty reduction, and human development and need to be analysed in detail before drawing any conclusion regarding the impact of zones on human development and poverty reduction.

2.2 Skill Formation (Human Capital Formation) Effects

There are various modes by which SEZs can positively contribute to human capital formation.

One is the firm level activity whereby the host country labour force acquires skills from within the firm through training and learning by doing on the job (Kusago and Tzannatos 1998). Zone units can thus directly affect the skill formation as workers are provided additional training on- and off the job. Local employees of multinational corporations (MNCs) in some cases are sent to their headquarters abroad or elsewhere for middle and, more often, higher management training, and advanced technician training. Training may spread broader than enterprise programmes.

The second method involves upgrading of the education system to cater to the needs of the zone units. In the Shenzhen SEZ (China), Sri Lankan SEZs and Mexican maquiladoras, institutes are established to improve technical and vocational skills of workers in the zone. In Taiwan, some cooperative training programmes between schools/colleges and the enterprises in the SEZs are being developed. These programmes aim at providing technical education at the factory rather than at the institution. Zone units may also be setting up training institutes to impart training to the labour to create the relevant pool of skilled labour.

Skill formation for the poor unskilled workers also occurs through assimilation of industrial discipline. This might increase the welfare of poor unskilled workers by increasing the range of job opportunities available to them. Improved skills and productivity increase workers' income earning capacity. Given the high labour turnover rate in the SEZs, domestic firms can benefit from this training by hiring workers previously employed in the zone firms.

In the long-term, the creation of a macro environment in which returns to education and skill development are high, is an important component of the skill formation effect of SEZs. Zone units raise the demand for and wages of skilled workers through technology transfer and capital investment, which in turn provides positive incentives for educational attainment and skill formation.

Finally, SEZs offer a highly conducive investment climate to attract FDI by making up for infrastructural deficiencies and procedural complexities that characterize developing countries. Typically, FDI brings with it technology transfer, managerial,

and other skills (such as marketing and distribution), access to markets and training for staff. Foreign entrepreneurs may set an important example for potential domestic entrepreneurs by demonstrating that the right combination managerial, technical and marketing know-how can allow organizations to profitably enter world markets (Hoffman 1991; Rhee and Balot 1990; and Johansson 1994). The export knowledge of foreign firms operating in SEZs is expected to spill-over to domestic firms in SEZs and then to those in the domestic economy. Through such linkages SEZs may enable firms in the rest of the economy to master production, distribution and marketing skills important for enhancing international competitiveness. SEZs can thus play a crucial role in upgrading domestic entrepreneurial skills.

2.3 Technology Upgrading Effects

SEZs attract export-oriented FDI and promote other forms of collaboration between local firms and MNCs. For instance, SEZs facilitate the insertion of domestic SMEs (small and medium enterprises) into global value chains by offering them an enabling investment climate (Gereffi 2005). Global standards, low-cost competition, and advances in technology raise challenges for the SEZ units competing in global value chains. This stimulates learning and innovation which are crucial aspects of human development.

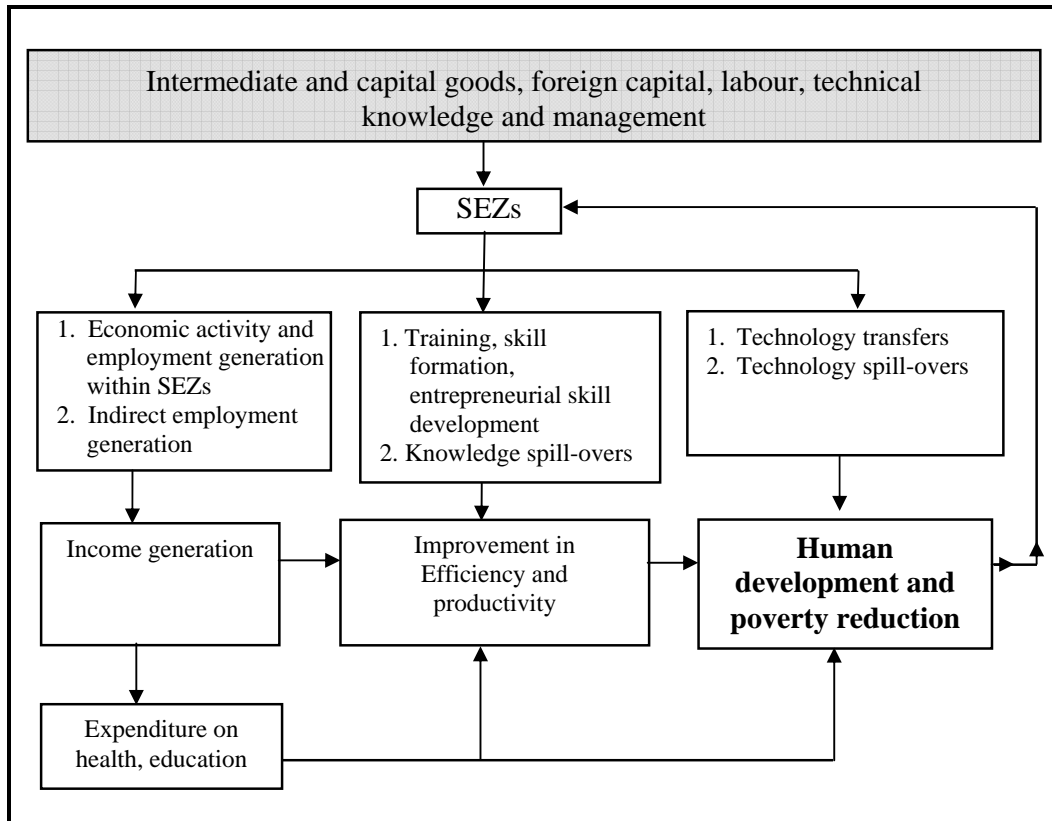
Two distinct types of value chains are identified: those that are producer-driven and others that are buyer-driven (Gereffi et al. 2005). The former type characterizes those value chains in which multinational enterprises (MNEs) outsource the production of components and play the central role in controlling the system. They provide technology to the networked producers. This arrangement is common in capital- and technology-intensive industries such as automobiles, computers and electronics. In contrast, the latter type refers to primarily low-tech labour intensive industries in which large retailers, branded marketers, and trading companies play the pivotal role in setting up decentralized production networks in a variety of exporting companies, typically located in the 'Third World'. In this case MNEs are marketers of products only; networked producers need to arrange for raw materials and technology themselves. Participation in these chains allows producers to upgrade themselves technologically on continuous basis (Heron 2004). For instance, many local firms become responsible for original equipment manufacturing (OEM) wherein they source raw materials locally and manufacture products to the specifications of foreign buyers. But having established a range of technological skills through learning, these firms transfer into 'original brand name manufacturing' (OBM).

Learning and knowledge created in SEZs is eventually transmitted to domestic firms supplying to the SEZ firms through backward linkages when the companies within the SEZ buy inputs from the host country. Direct transaction of technology and indirect spill-overs through various channels such as copying, reverse engineering, and movement of workers and managers between foreign and domestic companies also facilitate transmission of knowledge to the rest of the economy. Further, trade bodies, manufacturers' associations and export marketing bodies which provide a useful platform to interact and to foster closer rapport among members act as valuable

forums for information sharing and spillovers. Thus, SEZs are not enclaves/foreign territories that are functioning in isolation, as many believe.

Linkages between SEZs and human development are provided in Figure 1.

Figure 1 : Linkages between SEZs and human development



Source : Author's contribution based on the existing literature

The above analysis suggests that SEZs impact on human development through three broad channels: employment generation, skill (human capital) formation and technology upgradation. Each of them exerts two types of effects: direct and indirect. For instance, employment is generated directly when zone units and administration hire labour. The demand for complementary goods and services generates indirect employment. Similarly, the skill formation effect operates directly when workers are given specific training by the firms or when they acquire skills by working in the zone units. The indirect channel becomes operative when the spillovers take place through movement of workers to domestic areas. Finally, foreign collaborations are a direct source of new technology, managerial, and marketing networks in the zones. But they also narrow the technology gap between the foreign and domestic firms indirectly by promoting spill-overs within the zone and then outside the zone. Direct impact in each case may be empirically analysed but indirect effects, which operate through backward and forward linkages are difficult to measure. They can only be assessed by analysing the extent of such linkages. This paper focuses primarily on the direct effects of SEZs.

3. Are SEZ Effects Unambiguous? Review of the Literature

3.1 Direct Effects

3.1.1 Employment Effects

Employment generation: While analysing the direct employment impact of SEZs, one finds that they have played a significant role with respect to their contribution to employment creation in several countries. Many of the most successful SEZs in terms of employment creation were established in Asia. According to an estimate (Jenkins et al 1998), among zones that have been in operation for five or more years, the median zone in Asian countries has 10,500 employees, while in Latin America the median zone has just over 3500 employees. Taiwan and Korea have been the two most successful examples (Chaudhuri 1984). Indonesia, Malaysia, Thailand and Philippines in Asia are other successful examples of employment creation by SEZs. More recently, China followed by Vietnam, Bangladesh and Sri Lanka emerged as successful demonstrations of SEZ effects on employment. According to ILO (Online)¹, the greatest number of jobs is created in China, with some 30 million employed in the SEZ sector. In Bangladesh, total SEZ employment grew from mere 624 in 1983 when the first zone was set up in Chittagong, to over 144,000 by 2003–4. Currently, SEZs constitute 6 per cent of the manufacturing employment in the country (Aggarwal 2006). According to Mondal (2003), in Bangladesh, growth of employment in the SEZs is much faster than in the total organized manufacturing sector that was over sixteen times that of the organized manufacturing sector during 1983–4/1987–8 and over four times higher 1988–9/1999–2000. In Sri Lanka, total employment in SEZs stands at 104,237 which accounts for around 10 per cent of the manufacturing employment (Aggarwal 2006). It is uncertain whether these economies would have been able to create so many jobs and as much income in the absence of SEZs.

In Africa, Mauritius which introduced its SEZ programme in 1970 reduced official unemployment from 23 per cent in 1979 to 2 per cent in the early 1990s (before it increased in recent years to 8 per cent in 2000) as the country's SEZs generated 88,000 new jobs. As a matter of fact, SEZs in Mauritius began to experience labour shortages at the end of the 1980s and began to import foreign labour. Other successful examples in Africa, include Madagascar, Tunisia, Egypt and to a lesser extent Togo.

SEZ activity in Latin America is highly concentrated in three countries: Mexico, Brazil, and the Dominican Republic (Jenkins et al 1998). In the Dominican Republic, there were more than 19 SEZs in the late 1990s that employed about 141,000 workers. Some of the zones in the Dominican Republic are among the largest SEZs in the world. Two of the zones: the Santiago and the San Pedro de Macoris employ about 35,000 workers each (Jenkins et al 1998). All successful examples are not necessarily among the small economies. Even in a large economy like Mexico, zones have played

¹ ILO (Online) 'ILO database on export processing zones' compiled by Jean-Pierre Singa Boyenge, website : <http://www.ilo.org/public/english/dialogue/sector/themes/epz/epz-db.pdf>

an important role in creating employment. Most of the manufacturing employment created in Mexico during 1988-1998 was in the Maquila sector. Manufacturing employment excluding Maquila had been almost stagnant between 1988 and 1998, whilst maquila employment increased from around 300,000 workers in 1988 to almost a million in 1998. The share of maquila in manufacturing employment increased from little over 10 per cent in 1988 to over 26 per cent by 1998 (Armas and Sadni-Jallab 2002).

In Central America, Costa Rica, Nicaragua and Honduras have been the examples of successful zones. Between 1991 and 1996, employment in Costa Rica zones increased more than 7 per cent per annum. Employment in Honduras zones increased more than 40 per cent per year between 1990 and 1996. SEZ employment accounted for almost 20 per cent of industrial employment in 1995 in Nicaragua (Jenkins et al. 1998).

There are also countries where zone development and resulting employment creation did not live up to expectations. A report covering Southern Africa points to distinct and common SEZ failures (Jauch 2002). In particular, employment creation has been meagre. Kenya for instance spent millions of dollars on SEZ promotion but in the first five years, only 2800 new jobs were created (Rolfe et al. 2004)². Senegal established its first zone in Dakar in 1974. In 1999, twenty years after its creation, the zone was shut down (Madani 1999). At the time of its demise, it had just 14 active enterprises with a mere 940 jobs. In Central America, Guatemala zones could not live up to expectations. According the official figures, traditional SEZs in Guatemala had only 9 firms employ around 1400 workers in the late 1990s (Jenkins et al. 1998). There are several such examples across continents. These failures in turn could be attributed to the failure of SEZ policy to offer a comprehensive package of world class infrastructure, quality governance, good location and attractive fiscal incentives, which is crucial to attract investment in SEZs (Aggarwal 2006)³.

Some scholars argue that even among those countries where SEZs have experienced success in terms of generating employment, there are nations (such as Philippines and Indonesia) where the socially explosive unemployment issue has not necessarily been resolved because the annual increase in the size of the labour force in these nations dwarfs such employment as the SEZ may generate (Madani 1999). But others suggest that the share of EPZs in national employment is an unsatisfactory indicator of the zones' effects on employment and poverty alleviation. It is possible that the establishment of EPZs benefits disproportionately the industries that are intensive in the use of unskilled labour since in developing countries these are the industries that are likely to develop under the free trade regime (Schwellnus 2003). In that case the impact of zones on regional employment and poverty may be substantial which may not be captured in the macro picture.

² In recent years, Kenya's EPZs have become the center of Kenya's successful garment and apparel sector (USTR 2006).

³ Some of the factors responsible for SEZs' failures are : custom logistics (Cameroon), poor governance (Cameroon, Senegal), poorly designed policies (Senegal and in initial phases India), low attractiveness of zones vis-à-vis the rest of the economy (Kenya, Guatemala¹), labour related problems (Southern Africa, Guatemala) and poor location (such as in Koggala in Sri Lanka and Eshwardi, Uttara and Mongla in Bangladesh) (see for instance, Watson 2001, Madani 1999, Aggarwal 2006).

Sometimes it is also argued that employment opportunities created within SEZs are not the net addition to employment; they replace old jobs outside the zones. There is therefore a very small net employment effect of zones. Little research literature is available on this. However, some country-specific studies report that the net addition to employment opportunities by SEZs has been positive. Athukorala (1997) cites a study, which suggests that SEZ firms contributed significantly to a rise in the labour participation rates, notably the entry of young women into the labour force. In Bangladesh, the electronics industry hardly existed before the SEZ programme was put in place—SEZs created new job opportunities in this sector (Mondal 2003). Besides, growth rate of employment in the SEZs is about three-fold of that in the country as a whole, reflecting very little or no job replacement in the domestic tariff area and new job creation in the SEZs. A meaningful analysis of net employment outcome however, requires survey-based analysis on previous labour market status of SEZ workers and alternate employment opportunities for them, which is scarce in the literature.

Female employment: Women dominate the workforce in EPZs in most developing countries. For instance, in Philippines the share of women workers in total EPZ workforce was 74 per cent in 1980. It remained the same in 1994. In Korea, it was 70 per cent in 1990. In Mexico, it was as high as 77.4 per cent in 1981; it declined to 60 per cent by 1993. In Dominican Republic, it was 60 per cent in 1995. In Bangladesh and Sri Lanka, it has been above 70 per cent.

Some argue that the high proportion of female employment implies that the creation of SEZs does not reduce the local unemployment rate. This is because prior to being employed in the SEZs majority of them were not part of the labour force (see Kusago and Tzannotos 1998 for discussion). Many others however have shown that increased employment opportunities have empowered women and have made them more independent improving their relative status and bargaining power within households (Heyzer 1988; Dunn 1994; Joekes and Weston 1995; and Kibria 1995). Madani (1999) reports that a 1981 survey in the Dominican Republic found that SEZ wages were the main source of income for 38 per cent of women working in these zones and that almost half of them were single, divorced or widows. According to Dunn (1994) many of the women workers were breadwinners for their household as well. ILO (1998) reports that in Guatemala 45 per cent and in Honduras 22 per cent of women reported that they were the sole source of income. It has been established in the literature that the *economic participation* of women—their presence in the workforce in quantitative terms—is important not only for lowering the disproportionate levels of poverty among women, but also as an important step toward raising household income and encouraging economic development in countries as a whole (WEF 2005). SEZ opportunities have provided job opportunities to many young women from rural and adjoining areas that have been instrumental in reducing poverty in these regions.

But there are several reports of exploitation of women in SEZs. The vast majority of workers in SEZ firms are young women aged 16–25 years (Kreye et al., 1987). It is found that women are paid less than men for similar jobs (Jahan 2003, Bhattacharya and Rehman 1999 among others) and are subjected to sexual harassment and violence. Further, there is evidence that the quality of the employment is generally poor. Female employment is concentrated in low paying and low productive jobs. As the nature of employment in SEZs evolves with higher technology inputs, women are

thrown out of employment. It has been observed that the proportion of women in SEZs has declined over time (Kusago and Tzannotos 1998; Cling and Letilly 2001) in many countries. As wages rise, more men are attracted to SEZ employment and as production requirements increase (such as supervisors or skilled workers), demand for male workers increases. Thus SEZs are a mechanism of exploitation and not of women empowerment. Country-specific experience may vary. For instance, Feng (2006) in his analysis of 3 Chinese zones : Tianzhu, Tongzhou and Guangzhou, does not find evidence of sexual harassment and other pressures on women workers.

ILO (1998) concludes that SEZs do play an important role in employment generation in developing countries. But employment generation by itself does not ensure human development and poverty alleviation. Crucial questions are whether employment in EPZs results in higher wages, better working conditions and higher levels of living. In what follow, the relevant literature on each of these issues is reviewed in detail.

Wages: The general perception is that minimum wages paid in the zones are lower than those paid outside the zones. This is because labour laws are not extended to the zone firms and where these laws are applicable they are not enforced strictly. In Costa Rica, Panama (Madani 1999), Haiti (Heron 2004) and Pakistan (Kemal 2001) for instance, SEZ wages are reported to be lower than the wages in the non-SEZ area. However several sources (OECD 1996; Romero 1995; Razafindrakoto and Roubaud 1997; ILO 1998) report that SEZ wages are higher on an average than wages outside the zones or the minimum wages set by the SEZ authority/government. Besides, zone enterprises generally use remuneration systems such as piece-rate or incentive schemes, which give workers a higher take-home pay. In some countries, such as Korea (Oh 1993), Malaysia (Kusago and Tzannatos 1998) and Haiti (Heron 2004), wages in SEZs were initially lower than in non-SEZs but became higher after some point in time. In China, wages and other monetary benefits such as occupational injury insurance and the medical allowance are found to be more attractive in zones than in the domestic economy (Feng 2006). Madani (1999) and Kusago and Tzannatos (1998) argue that any country specific generalization is difficult. Wage gaps between SEZs and non-SEZs vary across zones in the same country and across sectors in the same zone.

Romero (1995) argues that the critical factor in determining whether the wages paid by SEZs are higher or lower than the rest of country is whether labour force in SEZs is organized or not. But empirical evidence does not support the hypothesis. In Bangladesh (Mondol 2003) for instance, minimum wages are set at a higher level than in the rest of the economy and these are implemented effectively. Paying higher wages could, in fact be part of the firm's tactics to prevent such unionization. Presence of labour unions therefore is not a pre condition for higher wages.

Working conditions: There is a large body of literature on the working conditions of SEZ labour. One stream of literature argues that violation of workers' rights, compulsory overtime, job insecurity, poor working conditions, use of pressure tactics to meet deadlines, and in consequence depletion of human capital are widespread in the zones (ICFTU 2004, Phillips and Xaba 2002). The popular economic literature in Sri Lanka (Voice of Women 1983, Bastian 1984, Hettiarachchi 1991), India (Dewan 2001, Majumdar 2001, PRIA 2000), Bangladesh (Hossain 2001) has criticized the zones vehemently for labour exploitation. An ICFTU study (2004) carries illustrations

of workers' plight in Chinese SEZs. It is argued that although average wages in some SEZs are higher than wages outside the zones, this often implies longer hours of more intensive work than in non-zone enterprises. According to an ILO study (1998), zones' workers were working in 10- to 12-hour shifts that could go up to 16 hours during peak periods. A number of the working practices in SEZs have the effect of prolonging the working shift. Some plants use a quota system, which workers have to meet in order to receive their day's pay. In some cases the workers are obliged to work beyond the normal shift in order to fulfil the quota. Kusago and Tzannatos (1998) reported that in China, average working hours vary from 54 to 77 hours per week. Hours of work tend to be long in SEZs posing health and safety problems. Mondal (2003) reports high intensity of work with long working hours per day, shift work at unsocial hours and a very high number of working days per year in Bangladesh zones. Occupation-related health hazards are a subject of concern in some SEZs (Dunn 1994). Health services in the zone and the local community are often limited, and zones are seldom equipped to deal with the specific problems of women's health. Kusago and Tzannatos (1998) report health issues in SEZs in a number of countries including Sri Lanka, Malaysia, Philippines, Korea and Mauritius. Jobs are threateningly impermanent; contracts are short-term, and companies come and go with little notice. Mass redundancies without compensation, deductions from or non-payment of wages, illegal closures followed by re-opening under another name further add to woes of the workers. Hayter (2001) discusses how the labour laws, even if applicable to zones, are flouted by the authorities and SEZ units. ILO reports have also revealed numerous violations of fundamental labour standards in many SEZs. Schoepfle and Prez-Lopez (1995) and Briggs and Kernaghan (1994) refer to the examples of the Dominican Republic and Haiti respectively where poor conditions in the SEZs have led critics to argue that zones are exploitative mechanisms of generating employment. These conditions in Haiti were exposed by Gereffi *et. al.* (2001). Since then, there has been strong pressure from labour organizations and activists to introduce codes of conduct and monitoring systems.

Another stream of literature however finds that working conditions in the zones reflect nation-wide practice. Oh (1993) for Korea reports that weekly working hours in the zones are restricted to 44 hours which is a nation wide practice. Sivalingam (1994) for Malaysia, Bhattacharya (1998) for Bangladesh and Remedio (1996) for Philippines report that working weeks of stipulated working hours are adhered to in the respective country zones. These studies find that health and safety standards are also followed in the zones strictly and that there are no major health or safety problems in the zones. These studies also show that the working conditions in the zones are better or similar than those in the firms outside the domestic area (Romero 1995; Rasiah 1996 for Malaysia; Bhattacharya 1998 for Bangladesh; Mondal 2003 for Bangladesh; Willmore 1997 for Caribbean countries; Remedio 1996 for Philippines). It is found that SEZ-firms are in general more modern, cleaner, more spacious, better ventilated and better lit and therefore offer better working conditions. Feng (2006) finds that China's zones are better than the domestic economy enterprises in such aspects as working time, overtime payments and sanitary conditions, but workers report the presence of health hazards and poor ventilation. Clearly, the findings are mixed and sometimes conflicting.

Living conditions: Improvement in living conditions of labour is an important aspect of human development and poverty reduction. It is likely that firms take measures that

are directly targeted at improving living conditions of labour to improve their productivity. The main areas of firm intervention concern transport facilities, housing, health and education of children of labourers. Data on the provision of these services is scarce. However, a few studies have examined these aspects of the zones. For instance, Oh (1993) for Korea and Bhattacharya (1998) for Bangladesh report that SEZ companies provide for transport for their workers. Broad and Cavanagh (1993) for Bataan, Remedio (1996) for Philippines and Bhattacharya (1998) for Bangladesh provide evidence on the provision of medical facilities provided by the zone units. Maskus (1997) find positive correlation between health conditions and the presence of foreign firms in the zones. There is also evidence of the provisions of free lunches and food coupons in the zones (Bhattacharya 1998, Schweltnus 2003). Finally, units in some of the zones are reported to be providing housing facilities, housing allowance and dormitory facilities as well (Oh 1993, Bhattacharya 1998, Remedio 1996). In China, most workers (from three zones : 2 in Beijing and one in Guangzhou) report that the EPZ job has improved their life in such aspects as income, living conditions and professional development (Feng 2006). Jenkins et al (1997) observe that privately run SEZs are better equipped to provide such facilities in Central American countries than the government run SEZs.

In sum, it is difficult to generalize findings across all countries and zones. Zone specific and country specific analysis is important. Even within a country, findings may be conflicting over different time periods because, as suggested above, zones' characteristics change over time. Furthermore, comparisons need to be made with units outside the zones to draw any firm conclusion regarding the effects zones have on living conditions.

3.1.2 Skill (human capital) Formation Effects

SEZ Employment and Skill Formation: During initial phases, SEZs are dominated by labour-intensive industries such as clothing, footwear, and electronic component assembly. These industries use simple low-cost technology and require a low-skilled workforce. Workers are thus trapped in low skill jobs. It is however argued that SEZs still help in creating skill base by introducing workers to the rigours of industrial discipline, punctuality, quality control and meeting deadlines. While supporting this argument for the Dominican Republic, Willmore (1997) claims that the majority of labour working in these zones had entered the labour market for the first time and all positions were held by the nationals. As a consequence, zones became instrumental in equipping them with skills and experience. Matthews and Kaplinsky (2001) however argued that "prior experience" is considered a primary criterion for recruiting labour in the zones and thus zones are benefited by the labour's experience. It is not labour that gets such benefits from zones.

On the job training and skill formation: Knowledge creation in the zones also occurs through on-the-job training. Critics argue that such training is of short duration and covers assembly type of activities. Kusago and Tzannatos (1998, pp 13-15) report that training for factory operators is mainly on-the-job and lasts from a few weeks to usually no more than three months. The training is mostly task-specific, geared to enhancing productivity and efficiency in the firm's operation. In some cases, workers in SEZs receive more substantial training but this is typically restricted to the high-end skills at a small scale. In Taiwan, only 1,500 workers received overseas training

between 1968 and 1986— a little over 80 on average per year. Rhee *et. al.* (1990) for Dominican Republic supports this hypothesis. He finds that the learning curve of labour is steep in the first few months; thereafter it flattens out. Feng (2006) however reports that workers find better professional development prospects in the zones relative to outside the zones. In Taiwan, some cooperative training programmes between school/college and the enterprises in the SEZs are being developed. In Maquiladoras, enterprises engage in various forms of training including management skills, production processes, quality control, product design, equipment maintenance and use. Raafat *et. al.* (1992) examined training programmes of enterprises in Maquiladoras of Tijuana, Mexico. He found that training practices and the course of technology transfer within factories in SEZs could be upgraded easily. Most existing studies therefore find this type of training unsophisticated, with little potential to advance the career opportunities of workers through skill acquisition that will remain relevant even if they were to stop working in SEZs (Abeywardene *et. al.*, 1994; Sivalingam, 1994).

Madani (1999) argues that successful human capital formation depends on the sophistication of the economic activities carried out in the zones. Kusago and Tzannatos (1998) have shown that units move upward in value chains as SEZs evolve over time. This is reflected in the educational attainment of workers in SEZs which has changed dramatically over time in countries such as Korea, Taiwan and Sri Lanka. SEZs cannot therefore be dismissed as islands of low productive jobs.

Demonstration effect and entrepreneurial capabilities: The examples of East Asian zones are best illustrative of demonstration effects and upgradation of entrepreneurial capabilities. These countries initially relied on assembly type operations. Gradually they became responsible for ‘original equipment manufacturing’. Finally, they got into ‘original brand manufacturing’. However, these gains did not come about automatically. Government played a proactive role in the evolution of the zones and ensured the maximisation of benefits from SEZs.

3.1.3 Technology Transfer and Technology Creation Effects

There is little research conducted on technology transfers and technological activities of SEZ units. The implicit assumption seems to be that such activities are either not taking place in SEZs or are negligible at best. Some argue explicitly that SEZ investment does not bring the same technology as investment in the rest of the economy. The low skill assembly type operations in the SEZs leave little scope for technology transfers (Madani 1999; Heron 2004; Armas and Sadni-Jallab 2002; among many others). However, transition of zones from low value added activities to high value-added technologically sophisticated activities may introduce technology component in the zones. Examples of the success stories (East Asia, Mauritius, emerging Asian economies) suggest that SEZs may contribute to technology transfers and technology creation. To the best of our information, there is no such study for India’s zones. A detailed analysis of technological activities is therefore called for.

3.2 Indirect effects

3.2.1 Indirect employment

A complete assessment of the employment impact of EPZs should take into account both direct and indirect employment creation by zones. Unfortunately, comparable data on the indirect employment effects of EPZs are not widely available. Limited evidence that is available indicates that indirect employment effects of zones could be more pronounced than direct effects. For instance, Romero (1995) reported that in 1993, 174,000 indirect jobs were created by the *maquila enterprises* in Honduras where, at the time, the workforce in the zones was less than 50,000. Similarly, indirect jobs generated by firms outside the Katunayake Zone (Sri Lanka) was said to be three times the number in the zone, according to the Chairman of the Free Trade Zone Manufacturers' Association (Romero 1995). The ratio of indirect/direct jobs created was as high as 1.4 in Madagascar (Razafindrakoto and Roubaud 1997) and 2 in the 1980s in Mexico, 2.7 in Puerto Rico. While analysing the employment impact of Masan SEZ in Korea, Cling and Letilly (2001) have argued that the success of Masan SEZ (Korea) in direct employment contribution is moderate but its impact on indirect employment is expected to have increased substantially. This is because subcontracting to local enterprises in this zone has grown considerably. There were 76 sub contractors in 1976 representing 15 per cent of the jobs in the SEZ working directly for the zone. By the end of 1980s, the number of domestic subcontractors increased to 525. The number of employees in these companies was roughly the half of the SEZ employment.

As discussed earlier (Section 2), demand for complementary services and goods may also generate employment opportunities in several sectors of the economy. According to Curimjee (1990, p. 111) the construction, transportation and financial sectors have all been greatly stimulated as a result of zone operations in Mauritius. In Sri Lanka, local producers of packing materials grew significantly and began to play an important role in supplying these materials to SEZ firms (Wijewardane 1990, p. 157).

The indirect employment effect of SEZs however depends on backward and forward linkages of the export processing zone industry with local suppliers of raw materials and other required inputs and the success of SEZs in attracting investment. The creation of backward linkages with the expansion of investment in zones would certainly help to generate more indirect employment.

3.2.2 Skill and Technology Spill-over Effects

Labour movement from zones to the non-zone sector may result in spill-over of skills into the rest of the economy. It is argued that labour turnover is high in the zones, which, in fact, facilitates such spill-overs. There is no data to support this argument. Kaplinsky (2001) finds little evidence of SEZ labour being recruited by non-zone employers, thus making it difficult to conclude that SEZs lead to spill-overs of skills to the domestic economy. Johansson and Nilsson (1997: 2121-23) tested the demonstration effect of SEZs. Their study was based on a sample of ten countries. They found that the export generating (or catalytic) effect of the Malaysian SEZs was relatively larger than of other countries. Foreign affiliates attracted to the SEZs stimulated local firms to export by showing them how to produce, market, and

distribute manufactured goods in an international forum. In other countries, however, it was not significant. Demonstration and spill-over effects depend on the zones' ability to attract FDI, perpetuate continuous technology transfers, forge backward linkages with the rest of the economy, and the level of development of the local entrepreneurship itself. These effects may therefore be country-specific.

In general, indirect effects are expected to be directly related to linkages between SEZs and the domestic mainland which in turn are reflected in the utilization of domestic raw material inputs and subcontracting arrangements with domestic firms. Experience of host countries varies with respect to local sourcing (the share of domestic raw materials to total raw materials used by firms in SEZs). Zones in some countries (for instance, the Republic of Korea, Taiwan and Malaysia) have depended heavily on local sourcing but most countries (including, Sri Lanka, China, Philippines, and Mexico) report low levels of sourcing by zones from local units (Kusago and Tzannatos 1998; Madani 1998). Poor backward linkages may partly be attributed to the fact that zone firms import a large proportion of their raw and intermediate inputs from the rest of the world leading to low value addition within the zones (Jenkins et al 1998 for Central American zones; Mondal 2003 for Bangladesh zones; Amirahmadi and Wu 1995 for selected Asian zones). Evidence on subcontracting is limited. Kusago and Tzannatos (1998) examined the extent of subcontracting in selected zones in Malaysia, Korea, China, Sri Lanka and Mauritius. They conclude that subcontracting has been rather limited in most countries with the only noticeable exception of the Republic of Korea which explicitly formulated government policy in favour of local subcontracting⁴. There is some evidence of subcontracting in Malaysia as well. Although backward linkages in Malaysia are not significant, Sivalingam (1994) reports some cases (firm-specific) where such linkages are substantial. Empirical evidence thus suggests that linkages between the rest of the economy and SEZs cannot be said to prevail across the board (Madani 1999). Indirect effects of SEZs are therefore zone- and country – specific.

3.3 A Life Cycle Hypothesis of SEZs : Towards Generalisation of Human Development Effects

In sum, the employment and human development effects of SEZs are not unambiguous. In view of the existing empirical evidence, we intend to propose a life cycle hypothesis of SEZs for analysing their effects on human development. This suggests that there are three broad stages in the life cycle of SEZs and the channel through which zones impact on human development and poverty depends on which phase of life-cycle the zones are in. In the initial stages of economic development of an economy, zones are dominated by assembly-type, low-skill, labour intensive production. At this stage, the most important contribution that the zones make is to the alleviation of the unemployment challenge. They primarily provide employment for unskilled workers and for those at the lower end of income distribution; generate incomes for them and have poverty reducing effects. Human development effects may not be significant at this stage due to lower wages and poor working conditions. As

⁴ The Korean government initiated 'outzone processing scheme,' which allowed the enterprises in SEZs to use non-SEZ firms for the production of exported goods. This scheme also created some incentives for local firms to upgrade their products to meet world standards (Healey and Lutkenhorst, 1989: pp28-32).

the economy develops, SEZs enter the second phase, and the skill component to labour employed increases. Second generation industries come up where the production processes adopted are more sophisticated and technologies implemented are more advanced. There is a need for human capital upgrading in this phase and therefore skill formation effect becomes operative, wages rise and working conditions improve. As the zones upgrade further with third generation firms emerging, using highly complex skill and technology intensive operations, they become important contributors to technology generation, transfers and technological spill-overs. SEZ effects would therefore depend upon the stage of their evolution which itself is contingent upon the level of development of the economy and is reflected in the composition of their economic activities. The last stage is when zones need to give way to technology parks and clusters. In other words, after a country achieve certain threshold level of development, relative significance of SEZs declines.

SEZs contribution can therefore be expected to vary across countries, within countries across zones and more specifically, over time. However, the evolution of zones and the benefits that they yield are not automatic. They themselves depend on a complex interplay of several factors including the quantum of activities generated by their establishment, the extent of backward economic integration into the economy and above all the government policies with the objective of maximizing gains.

This study undertakes to analyse the proposed effects in the Indian context. As suggested above, thus far, there has been no comprehensive analysis of labour effects of SEZs in India.

3.4 Data base for the Study

Though SEZs have been a feature of Indian policy since 1960, they have been much less successful than in many other Asian countries in terms of their share in total exports and export growth rates. In India, the share of SEZs in total exports is slightly above 5 per cent. The share of SEZs in exports does not set any standard for the benefits that SEZs may generate. In almost all the East Asian countries where zones proved to be successful engines of growth, the share of SEZs in national exports had been 5 per cent to 6 per cent. Furthermore, even though SEZs are not currently a primary export promotion instrument in India, their share in total exports is likely to increase dramatically with several zones under approval/construction in the country.

It is also important to note that as compared to SEZs of many other nations, Indian SEZs are well diversified in terms of the economic sectors represented in the zones. Table 1 provides summary information on the sectoral patterns of SEZ exports in India. It shows that labour-intensive, first generation firms (textile, food and leather) coexist with skill-intensive second generation firms (gems and jewellery, software, engineering) and technology-intensive third generation firms (drugs and high-value electronics and engineering products). All the three channels through which SEZs impact on human development can therefore be expected to operate in India.

Table 1 : Sectoral composition of SEZs in India: 2002–05

<i>Sector</i>	<i>As percentage of total zone exports</i>
Drug	5.6
Electronics Software	16.4
Electronics Hardware	16.1
Engineering goods	4.7
Gems and jewellery ⁵	39.9
Leather	1.3
Textiles	8.4
Plastic and rubber	1.2
Food	1.1
Trading	1.5
Others	3.8
Total	100.0

Source: Ministry of Commerce, Government of India

For analysing the impact of SEZs on employment, human development and poverty, we collected data by means of two primary surveys: one for the entrepreneurs in the zones and the other of labour employed in the zones through appropriately structured questionnaires. Three largest zones namely Noida, SEEPZ, and Madras were selected for the surveys. These three zones were the leading zones in India and accounted for three-fourth of SEZ employment and exports generated in India at the time of survey. We conducted interviews with managers of 75 randomly selected units across the three zones. The sample of firms in each zone was representative of the corporate population in terms of size, economic activity, age and sectoral distribution. We asked questions on wage structure, other monetary benefits, facilities provided to their workers, human resource practices and management of labour, provisions of labour training, acquisition of skills and technology, and technology transfers at their facilities. For selecting workers, we used the technique of stratified random sampling. Approximately 3 workers: two male and one female at each of the 75 plants were surveyed. In all we interviewed 229 workers. Table 2 shows their distribution by economic activity. It shows that the sample draws on a large number of semi- and unskilled workers to analyse their perspective. Of the total workers, 85 were previously employed in the non-SEZ sector, particularly in the small/informal sector.

Table 2 : Distribution of workers by the nature of economic activity

	Male	Female	Total
Managerial/ administrative (No.)	29	13	42
Per cent of total	18.3	18.5	18.4
Skilled labour	19	5	24
Per cent of total	12.0	7.1	10.5
Semi skilled	51	34	85
Unskilled	60	18	77
Per cent of total	69.6	72.2	71.0
Total	159	70	229

Source: 'Labour survey' conducted by the author

⁵ A large share of gems and jewellery may be due to the fact that these are high value items.

All the sample employees/workers were asked about their wages, working conditions, living conditions and human resource practices followed by their employers. The primary data generated through labour and enterprise surveys were supplemented with secondary data collected from the Ministry of Commerce and Development Commissioners' offices in all the central government SEZs.

4. Human Development Effects in India: Major Findings

4.1 Employment Effects

4.1.1 Direct employment generation

In 1966, the only operating zone in India was the Kandla SEZ. Total employment in the zone amounted to 70 workers. The number of SEZs increased to 8 by 1998. As a result, the level of employment also increased significantly to around 95,000 by 1999. Thereafter the level of employment declined marginally. But after the introduction of the SEZ Bill 2004, SEZ activities showed improvement. A major thrust was given by the government to SEZs in 2006 when the SEZ Act was enforced in February. Since then there has been rapid expansion in the SEZ sector. Total employment in the SEZ sector jumped to over 178,000 in November 2006 from 158,000 in March 2006.

Despite an impressive increase in employment in SEZs, their share in manufacturing employment remains modest, as of now (Table 3). Since their establishment in 1966 and until 1998 Indian SEZs contributed less than 1 per cent of total manufacturing employment. Since 1999, their share in total manufacturing sector has been slightly above 1 per cent. One may therefore argue that employment creation in SEZs relative to the rest of the economy is marginal in India.

Table 3: Total SEZ employment and share in the manufacturing sector employment in India in selected years between 1966 and 2006

Year	Employment (No.)	Share in manufacturing employment (per cent)
1966	70	-
1973	300	0.01
1980	6000	0.09
1990	35205	0.48
1998	77795	0.91
1999	84545	1.04
2000	81371	1.03
2001	95041	1.23
2005	1,00,650	1.05
Nov. 2006	1,780,00	na

Sources: Ministry of Commerce, Government of India; Annual Survey of Industries, various issues

Considering the fact that the zone sector in India has remained very small and until recently, virtually stagnant, it is not surprising that the share of SEZs in total employment is insignificant. But nevertheless, SEZs have had a substantial impact on the employment situation at the regional/local level, which is not captured in the overall picture. For instance, SEEPZ SEZ employs over 42,000 workers while Noida

and Madras SEZs employ around 20,000 workers each. This has made an enormous impact on employment generation in the regions in and around these SEZs. Entrepreneurs in Madras SEZ, during our visit to the zone, reported the scarcity of labour in that region. Vishakhapatnam and Falta SEZs provide employment to 2500 and over 2750 workers respectively, most of whom are uneducated or have low levels of schooling. These numbers appear insignificant. However, there are no alternative employment opportunities for them in the formal sector in adjoining areas and from that perspective, zones are viewed (even by workers) as instrumental in generating employment and alleviating poverty of these regions. During our interviews, workers revealed that they had no formal source of income prior to joining the zone. Many units in labour intensive sectors such as textiles and plastic and rubber, employ workers with primary or even no education, and provide them on-the-job training. This has improved the employment scenario in the region.

Employment generating potential of SEZs, as reflected in the employment elasticity of exports, is directly linked with their expansion (Table 4). With the new SEZ policy in place, therefore, massive expansion of employment opportunities is expected to take place.

Table 4: Employment elasticity of SEZs during various phases of expansion

Year	SEZ development	Average elasticity coefficient
1966-1971	Kandla zone was set up	1.09
1971-1974	No development	-3.59
1974-1982	SEEPZ was set up	.87
1983-87	No development	-1.05
1987-91	4 new zones were set up	.55
1991-00	Policy reforms initiated and SEZ investment expanded (Aggarwal 2006)	.62
2000-05	Though SEZ policy came up. It did not make much impact on SEZ investment.	.295

Source: Author's calculations based on the Ministry of Commerce database

Since employment elasticity is large in the initial stages of SEZs, new SEZs are likely to play a critical role in this country where over 60 per cent of the population is still directly/indirectly dependent on agricultural activities and the level of education attainment is very low.

Critics however argue that employment opportunities created within SEZs will not be a net addition to employment; they will replace old jobs outside the zones due to relocation/diversion of investment activities from the domestic mainland to SEZs. One must however understand that SEZs are set up to attract only export oriented activities which would not otherwise have come up due to poor investment climate and high cost of production in the economy. Most FDI outside the zones is domestic market seeking. But the new zones have attracted a number of foreign investors who until recently, were reluctant to come to India. These include Nokia (with its eight subsidiaries), Flextronics (with 10 subsidiaries), Apache, Samsung, Motorola, Brandix and Foxxcon among several others. SEZs have provided a platform to 'Electronics Manufacturing Services (EMS)' majors to set up their production

facilities in the country⁶. The EMS players work on thin margins and manage operations on scale and efficiency. SEZs offer them the enabling environment to deliver products from design to repair for their customers. EMS firms have plans to invest hundreds of millions of dollars over the next two years in SEZs to serve the domestic market and leverage low cost labour for the export market. SEZs have given a boost to the aerospace industry with a 1000 acres SEZ coming up in Bangalore⁷. Other industries that are benefited are biotechnology, automobile and pharmaceuticals. Of the 50 notified SEZs as on 13 December 2006, 34 are expected to create 687,565 jobs over the next 2 to 3 years. Clearly, the argument of no net addition to investment and employment opportunities is untenable.

4.1.2 Female employment

Contrary to the experience of many other countries, the proportion of female workers in total employment has never been substantial in India when viewed from a comparative perspective. While it had been above 70 per cent in many developing countries in the initial phases, in India it was less than 50 per cent. It declined continuously to hit 36.9 per cent in 2003 (Table 5). Though the declining trend in female employment is consistent with many other successful countries such as Mexico, Korea and Malaysia as discussed in Section 3, the share of female workers has come down to unusually low levels in the case of India. Does that mean that India's SEZs are not contributing to female employment?

Table 5 : The share of female workers in total employment: 1981 to 2003-4 (per cent)

Year	Kandla	Santa-cruz	Noida	Madras	Cochin	Falta	Vishakha-patnam	Surat	Total
1981	40.0	58.3							46.5
1985	40.0	53.3		93.0		37.5			46.6
1990	48.0	48.8	16.2	61.7	54.6	35.7	-	-	47.7
1996	39.3	37.8	25.3	69.5	61.2	38.6			44.8
2002	40.0	35.7	22.0	46.7	48.0	37.0	34.0	0.0	35.8
2003	40.0	35.7	22.0	46.7	48.0	33.0	28.8	14.0	36.9

Source: Ministry of Commerce, Government of India

While addressing the above question, we compared female participation rates in the zones with that in the rest of the economy in each SEZ-host state. For this, we divided the rest of the economy into two distinct segments: formal and informal. Information on the organized manufacturing sector employment is provided by the Annual Survey of Industry while for the unorganized sector, National Sample Surveys (NSS) report the employment data.

⁶ EMS industry which was until now unnoticeable is estimated to grow from \$900 million in 2005 to \$2.5 billion by 2010, making India a very attractive market for EMS investments, thanks to SEZs.

⁷ Over the past few months, approvals to the tune of Rs 850 billion were given and projects worth Rs 450 billion were in the pipeline.

Table 6: Women Participation rates in the organized and unorganized sectors in 2001 (per cent)

State (zone)	Organized	Unorganized	Total
Gujarat (Kandla)	5.2	18.3	11.75
Maharashtra (SEEPZ)	12.1	30	21.05
Tamilnadu (Madras)	37.6	78.7	58.15
W. Bengal (Falta)	2.1	70.5	36.3
U.P (Noida)	5.5	37.6	21.55
Kerala (Cochin)	57.1	95.3	76.2
Andhra Pradesh (Vishakhapatnam)	25.8	71.0	48.4
Gujarat (Surat)	5.2	18.3	11.75
All India	18.0	33.6	25.8

Source: Based on the statistics provided by the Ministry of Labour

Our analysis (Table 6) shows that the female participation ratio in the SEZ sector is higher than that in the organized sector but it is much lower than that in the unorganized sector in all the states⁸. This indicates that a large proportion of female workers have been working in the informal sector due to lack of job opportunities in the organized sector. The informal sector is characterized by inadequate safety, health and environmental standards. Poor working environment including inadequate premises and often very unsatisfactory welfare facilities, as well as practically non-existent occupational health services are causing large human and material losses in this segment of the economy (Forastieri 1999). SEZs provide an opportunity to female workers to shift to the organized sector which are characterized by higher wages and better conditions.

Critics point out that women workers in SEZs are typically 20 to 25 years old with poor bargaining power and hence, often subject to exploitation. Employment generation in the zones therefore does not empower them. Our sample study also reveals (Table 7) that a majority of women are in the age group of 20-29. But the figures are not very different for the male workers either. We find that the age distribution of male workers is also highly skewed with 61 per cent of males in the age group of 20-29. This seems to support Willmore's (1977) hypothesis that the majority of labour working in SEZs enter the labour market for the first time and zones equip them with skills and experience.

Table 7: Age distribution of male and female workers (per cent of total)

	Madras		SEEPZ		Noida		Total	
	Male	Female	Male	Female	Male	Female	Male	Female
Less than 15	0.0	0.0	0.0	0.0	1.4	0.0	0.6	0.0
15-19	13.2	21.6	3.8	0.0	5.8	10.0	6.9	12.9
20-29	57.9	62.2	69.2	91.3	56.5	60.0	61.0	71.4
30-39	28.9	13.5	19.2	8.7	31.9	20.0	27.0	12.9
40-49	0.0	0.0	7.7	0.0	4.3	0.0	4.4	0.0
50 and above	0.0	2.7	0.0	0.0	0.0	10.0	0.0	2.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source : Labour survey conducted by the author

⁸ Gujarat is the only exception where the overall female participation in labour force seems to be low.

If we consider the marital status of these women (Table 8), we find that a larger proportion of females are unmarried in the zones as compared to male workers. The reason could be rooted in the long term social conditioning in the country⁹. Single women (unmarried/widows/divorcees) are however among the most vulnerable sections in developing countries like India due to peculiar socio economic institutions¹⁰. Their economic empowerment therefore is important and SEZs can play a crucial role in this.

Table 8: Marital status of male and female workers in selected zones (per cent)

	Madras		SEEPZ		Noida		Total	
	Male	Female	Male	Female	Male	Female	Male	Female
Never married	33.3	62.2	61.5	82.6	42.0	30.0	40.5	64.3
Married	67.7	32.4	38.5	17.4	58.0	60.0	58.2	31.4
Separated	0.0	5.4	0.0	0.0	0.0	0.0	0.0	2.9
Divorced	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Widowed	0.0	0.0	0.0	0.0	0.0	10.0	1.3	1.4
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source : Labour survey conducted by the author

4.1.3 Migration

Some argue that SEZs will not generate employment for the people in and around the area. Evidence, however, suggests that SEZs do not trigger large migratory flows in India (Table 9). Of the 229 workers interviewed only 50 (22 per cent) migrated to take up the SEZ jobs. Migration rates are relatively lower for female workers (7 per cent) than the male workers (19 per cent). This is in contrast with the experience of many developing countries including Mauritius, Malaysia and Latin American countries where larger proportions of migrant workers are employed in SEZs.

Table 9: Migratory status of labour force in selected zones (No.)

SEZ	Gender	No. of workers migrated to get the job	No. of workers migrated within the state	No. of workers migrated out of the state
Madras	F	0	0	0
	M	3	2	1
SEEPZ	F	1	0	0
	M	13	6	7
Noida	F	4	2	2
	M	29	9	20
Total	F	5	2	2
	M	45	17	28

Source : Labour survey conducted by the author

⁹ After marriage, women moves in with their husbands' family. They can continue to do the job so only if their husbands approve of their employment. Single women are therefore more likely to be in the employment especially in the factory sector.

¹⁰ During our interviews some young girls revealed that they were working in the zone to collect dowry for their marriage as their parents were not in position to do so.

We found that most workers are native language speaking from the adjoining areas or from the same state. It is also found during interviews that they had already settled in the adjoining areas for jobs before joining the SEZ (Table 10).

Table 10: Distribution of workers by native language and place (Per cent)

	Female	Male	no information
Madras			
Native language speaking	86.4	89.0	0.0
Residents prior to SEZ job	57.7	76.0	0.0
SEEPZ			
Native language speaking	82.6	54.0	21.3
Residents prior to SEZ job	91.3	77.0	0.0
Noida			
Native language speaking	50.0	36.6	35.4
Residents prior to SEZ job	70.0	54.5	0.0

Source : Labour survey conducted by the author

4.1.4 Wages and Other Monetary Benefits

While examining the hypothesis that low wages are widely prevalent in SEZs, we gathered information on the national minimum wage rate and the lowest rate of minimum wages in UP¹¹, Maharashtra and Tamilnadu as on 1 January 2005 and adjusted them using the consumer price index to acquire the figures for 1 January 2006. These are reported in Table 11. The table also shows the minimum wages paid in different categories of employment in the selected zones as **reported by the management**. Apparently, the minimum wages offered in the zones are marginally higher than the *lowest* of the statutory minimum wages fixed for the unorganized sectors in all the zones. In SEEPZ SEZ, wages are substantially higher than the state level wages and national level minimum wages.

Table 11: Minimum monthly wages offered in the zones: Entrepreneurs' perspective

	Noida	SEEPZ	Madras	National minimum wage
Skilled	2350	3000	2500	
Unskilled	2000	2500	1750	
Skilled (contractual)	3300	4000	-	
Unskilled (contractual)	2200	3000	-	
Lowest of the minimum wage fixed by the State	1914	1390	1645	2120

Source: Entrepreneurs' survey conducted by the author and Ministry of Labour Reports

¹¹ According to the minimum wage rates in UP, an unskilled labourer is to get minimum wage of Rs 2600 per month, semi skilled worker Rs 2964 and skilled workers Rs 3290 per month.

Table 12 presents information on wages per month gathered from the **production workers** in our sample firms. The factory sector average for the rest of the economy was obtained from the Annual Survey of Industries 2003-04 and is reported in this table for comparisons.

Table 12: Wage structure of production labourers in the zones: Workers' responses

	Min		Max		Average		Average in the zone	Factory sector average*
	Male	Female	Male	Female	Male	Female	Overall	Overall
Noida	1250	1800	13333.3	20833.3	4035.3	7753.3	4512.0	4570
Madras	1800	1500	15000.0	13333.3	4775.4	2722.7	3749.1	3900
SEEPZ	2000	2000	12000.0	8500.0	4502.8	5072.2	4897.6	6617

Source: Labour survey conducted by the author and Annual Survey of Industries 2003-4

On comparing Table 11 with Table 12 we find that minimum wages reported by workers in all the zones is lower than what the management reported. However, they still remain above the lowest of the minimum wages in the respective states (except Noida). Besides, average wages in the zones are not very different from the factory sector average in the respective state (except Maharashtra). This is despite the fact that the factory sector covers large enterprises also. Finally, there is no substantial evidence of any discrimination against female workers. In Noida and SEEPZ, female workers appear to be fetching higher salaries which means that they are employed in better paying jobs¹². This finding is supported by ISST (2000) as well.

In short, though zone wages are not higher than the non-zone wages in India, there is little evidence to support the argument that low wages are widely prevalent in the zones due to lax attitude of the authorities towards labour laws. During our visits to new zones, we found that in some of the new zones (for instance, Nokia and Flextronics), wages offered are significantly higher than outside the zones. Furthermore, we do not find evidence of discrimination against women in India's zones.

While zones are not associated with high wages, workers reported a higher level of income satisfaction in the SEZ job than outside it. We asked the workers whether they had a higher/lower or the same level of satisfaction in the current job. Of the 229 workers surveyed, 85 were previously employed in the non-SEZ (small/informal) sector. Only 20 per cent of these workers were more satisfied with their previous non-zone incomes. In all, a majority of workers (55 per cent) expressed their satisfaction with the wages that they were receiving in the current SEZ job. Interestingly, the satisfaction level was higher for the women workers. Over 65 per cent of the female workers interviewed were satisfied with their current incomes as compared with 54 per cent of the male counterparts. Our study thus does not support the argument that a substantial proportion of SEZ labour receives less than minimum wages (See Majumdar 2001, PRIA 2000).

¹² Many of them are receptionists or are in the administrative jobs.

4.1.5 Social Security and Bonus Benefits

The Employees' Provident Funds and Miscellaneous Provisions Act, and the Bonus Act are applicable to every factory engaged in any industry in which 20 or more persons are employed. All the firms included in the survey were covered by the Act. Our survey of SEZ workers suggests that over 66 per cent of the workers get bonuses and over 70 per cent of the workers are covered under provident fund. Coverage of female workers is even higher. There is, however, substantial variation across zones. While in SEEPZ SEZ social security and bonus coverage is as high as over 90 and 97 per cent, in Noida SEZ it is as low as 38 and 48 percent. In Madras EPZ it is 86 and 92 percent respectively.

To analyse the conditions prevailing outside the zone, we examined the social security and bonus act coverage of the 85 workers who were previously employed outside the zone sector. The findings are summarized in Table 13. Apparently, a substantially lower percentage of workers was enjoying these benefits outside the zones. This could partly be due to the fact that many of them were employed in the informal sector previously. But what is important to note is that employment in the EPZ sector has brought them substantial gains.

Table 13: Social security and bonus benefits: Comparison between zones and the rest of the economy (per cent)

	Sample of 85 workers with previous job outside the zones				Overall sample	
<i>Gender</i>	<i>Bonus coverage in previous job</i>	<i>Bonus coverage in current job</i>	<i>PF coverage in the previous job</i>	<i>PF coverage in the current job</i>	<i>Bonus coverage</i>	<i>PF coverage</i>
Female	58.3	66.7	41.7	75.0	72.9	84.3
Male	42.5	65.8	43.8	78.1	64.8	71.1

Source: Labour survey conducted by the author

4.1.6 Working Conditions

The Factories Act, 1948 is a comprehensive legislation that, in addition to approval, licensing and registration of factories, also regulates health, safety, welfare, working hours, annual leave and other working conditions of workers in factories. In what follows, we analyse the working conditions of labour against the background of the laws enshrined in the Act.

Working hours: According to the law, no adult worker shall be required or allowed to work in a factory for more than forty-eight hours in any week or allowed to work in a factory for more than nine hours in any day. Where a worker works in a factory for more than nine hours in any day or for more than forty-eight hours in any week, he shall, in respect of overtime work, be entitled to wages at the rate of twice his ordinary rate of wages. In addition, he is entitled to get one weekly holiday.

In our survey, almost all the entrepreneurs (with the exception of 4 entrepreneurs) reported 48 working hours per week in their factories. In addition, none of them reported more than 9 working hours on a single day. We gathered similar information from workers also. This information, presented in Table 14, also reveals that a majority of workers are working 48 hours per week. However a small section of workers has reported to be working over 50 hours and even 60 hours. But this is not a practice prevalent in the zones only. Outside the zones too, longer working hours are reported.

Further more, most workers work 6 days a week though a few (8 from Noida and 2 from SEEPZ) reported working 7 days a week also. Some workers reported that they were working 7 days in the previous non-zone job as well. This could be due to overtime practices or due to the nature of work. For instance, a person may be security guard.

Table 14: Distribution of working hours in the selected zones (per cent)

No. of working hours per week	Current zone employment (per cent of total responses)		Outside zone (per cent of those who had previous non-zone work experience)	
	<i>F</i>	<i>M</i>	<i>F</i>	<i>M</i>
35-40	0	1.89	0.00	0.00
41-50	87	79.99	84.3	80.78
51-60	11	14.21	15.3	17.5
over 60	1	3.14	0.00	1.67

Source: Labour survey conducted by the author

Overtime practices: On the issue of overtime, our study reveals that compulsory over time is not widely practiced in the zones. Only 2 workers in SEEPZ and 9 in Madras reported compulsory overtime. Noida is the only zone where 35 workers reported that overtime is compulsory. But, this is not uncommon even outside the SEZ sector. While working outside the zones, 20 workers from Noida and 16 from Madras were doing compulsory overtime work.

Optional overtime working is very common in the zones. Over 90 per cent of entrepreneurs in SEEPZ, 70 per cent in Noida and 50 per cent in Madras reported optional overtime practice in their companies. It was applicable for both male and female workers in the zones with the exception of Madras where less than one-fourth firms reported this practice for female workers. Our survey of labour suggested that working overtime is widespread in Noida. On an average over 51 hours of overtime was reported by 46 workers. On the other extreme, only 11 workers reported overtime with an average of 3 to 4 hours per week in Madras. Fifty eight workers in SEEPZ reported to be working overtime but the average overtime hours are 20 to 25 hours per week. Overtime thus is virtually compulsory owing to both employer pressure as well as financial pressure faced by workers which encourages them to earn more than the basic wages through overtime allowances. Of the 229 workers in our sample, 108 workers that is, 47 per cent were working overtime. But, 32 per cent of the workers who had worked outside the zone reported this practice outside the zones also.

Overtime compensation: All the entrepreneurs reported that they were paying higher wages for overtime hours. Workers reported that they got compensated either in the form of salary or leave but interestingly only SEEPZ SEZ workers reported to be paid more than the normal pay. Others (with the exception of 15 workers from Noida SEZ) did not get higher compensation than the normal pay for overtime. Thus, the compensation practices vary substantially across the zones.

Night shifts: The law does not permit night shifts for women workers. Our survey (Table 15) reveals that night shift is not compulsory for female workers in the zones. Very few firms reported compulsory night shifts even for male workers. Only 5 firms in Noida and one firm in Madras reported compulsory night shifts for male workers. Labour surveys confirmed this. However, female workers do exercise the option of working in the night shifts in the zone. Such cases though not frequent are reported in all the zones. In all, 13 female workers reported to have worked in night shifts. Night shifts are reported by 25 male workers but almost equal number of workers reported to be working in night shifts even outside the zone.

Table 15: Night shifts: workers' and entrepreneurs' responses (No.)

Zone	Entrepreneurs' response	Workers' response	
		Male	Female
Noida	Compulsory : 5	Compulsory : 16	None
SEEPZ	None	Not compulsory for male/female workers	None
Madras	Compulsory for men : 1	Compulsory : 9	None

Source: Labour and enterprise surveys conducted by the author

Food: According to the Factories Act 1948, in any specified factory wherein more than two hundred and fifty workers are ordinarily employed, a canteen or canteens shall be provided and maintained by the occupier for the use of the workers. Where more than one hundred and fifty workers are ordinarily employed adequate and suitable shelters or rest-rooms and a suitable lunch-room, with provision for drinking water, where workers can eat meals brought by them, shall be provided.

Our survey had 13 firms with more than 250 employees and. Of them, 8 firms had canteens or concessional food facilities (2 in Madras, 4 in SEEPZ and 2 in Noida) (Table 16). But interestingly over half the firms covered in the sample reported that they make some arrangements for serving eatables/food to workers. Some firms serve food for extra working hours while others serve tea/breakfast. There has been wide variation across the zones regarding this practice of serving food. While it is most common in SEEPZ (19 firms), such arrangements are unusual in Madras. What is important to note is that even though firms do not have subsidized canteens, many of them are making some arrangements to serve food as an incentive to work for longer hours/work more efficiently. This is an unusual practice outside the zones. Only three workers who worked outside the zone previously reported such facilities there.

Table 16: Basic facilities offered in the zones : The Management perspective

	Number of firms serving food	No. of firms offering health facilities	Free Check-up	ESI	Other arrangements
Madras	10	24	2	22	-
SEEPZ	19	21	13	14	Tie up with dignostic labs, doctor on panel, gym
Noida	14	17	4	10	Mediclaim, tie up with hospitals

Source: Enterprise survey conducted by the author

Health: Over 90 per cent of the units reported (Table 16) that they provided health facility to their employees. Free health check ups, tie ups with the hospitals, doctors on panels are reported frequently. However ESI coverage is rather low in the zones. Madras is the exception where this cover is provided to the workers in over 90 per cent of the firms. ESI is an important social security measure and the scheme provides a wide range of medical services and cash benefits to employees and dependents when they are ill. The low ESI coverage therefore is a matter of concern.

We queried the workers also on health and insurance facilities offered to them by the units. Their responses are summarized in Table 17. Only ten labourers reported to be covered by insurance in Noida. Since 10 firms reported that they are providing ESI coverage, we expected a much larger number. However in SEEPZ and Madras, ESI coverage is as expected. Workers who were previously employed outside the zone presented a gloomier picture of the conditions prevailing outside the zone. The coverage appears to be far lower outside this sector.

Table 17: Basic health facilities: Workers' perspective (per cent of total workers interviewed)

	Noida	SEEPZ	Madras	Overall	Outside the zone*
Any insurance for industrial accidents	12.8	56.0	81.3	49.1	18
Free health check up	12.8	68.0	38.7	39.3	10
Free/ con. health facilities hospital/dispensary	17.9	46.7	0.0	21.3	9.0
Medical reimbursement	14.1	30.7	8.0	17.5	6.0

* per cent of those who previously worked outside the zones.

Source: Labour survey conducted by the author

Other facilities: Under the Factories Act, in every factory suitable arrangements for sitting shall be provided and maintained. In every factory wherein five hundred or more workers are ordinarily employed the employer shall employ in the factory welfare officers. Employers are required to ensure that workplace (both office and factory) are adequately lit and sufficiently ventilated with adequate number of toilets and washing facilities. The State Government rules require that where thirty women workers are ordinarily employed there shall be provided and maintained a suitable room or rooms for the use of children under the age of six years of such women.

During the survey it was noted that these provisions were followed in most factories (Table 18) to the satisfaction of the workers.

Table 18: Other facilities: Workers' perspective

	Number of workers	Percentage of total
Adequate space	195	85.2
Presence of health hazards	33	14.4
Safe sanitary facilities	215	93.9
Safe drinking water facility at the work place	220	96.1
Ventilation facilities adequate	215	93.9
Satisfied with the lighting arrangements at work place	212	92.6

Source: Labour Survey conducted by the author

A small proportion of workers reported health hazards. Our analysis revealed that three-fourth of workers who reported health hazard were from the Madras SEZ. We asked if they were given training/safety kits to protect themselves from such hazards. While 88 per cent of the workers reported that they were given training, 70 per cent reported that they were also provided with safety kits to protect themselves.

Finally, we also asked the managers if they provided special facilities to women workers. No special provisions were reported from Madras and Noida. In SEEPZ, however 14 out of 25 firms provide special services in the form of crèches, special common rooms, and make up rooms for women.

Casual and Sick Leave: Under the labour laws, a worker is entitled to casual leaves, sick leaves and earned leaves. The survey findings reveal that most firms are allowing casual, medical and earned leaves to their workers. In addition to these regular leaves, workers are entitled to maternity leaves also. Most firms allow 84 days' maternity leave. However some firms extend it to 120 days. Only 5 firms (4 in Noida and 1 in SEEPZ) reported that they do not provide maternity leave. A few firms (6) are providing paternity leaves as well.

We then asked workers whether they were getting the various leaves they were legally entitled to. Their responses are summarized in Table 19. It appears that workers in SEEPZ and Madras are in a better position than those in Noida, so far as the leave advantage is concerned. Women workers from SEEPZ and Madras reported the facility of paid maternity leaves.

Table 19: Availability of leaves: Employees' perspective (per cent of respondents)

	Noida	SEEPZ	Madras
Medical	29.1	89.3	93.3
Casual	46.8	84.0	96.0
Other annual	39.2	84.0	2.7
Maternity	5.1	26.7	16.0
Whether paid Maternity	2.5	26.7	13.3

Source: Labour Survey conducted by the author

Other working conditions: We tried to assess the social aspects of the working conditions also. We asked whether there were provisions for the entertainment of labour/family interactions. Twenty-six firms reported that they had such entertainment programmes. Almost the same number of firms reported family gatherings as well. These events included picnics, festivals, get-togethers, sports day events etc. Workers were also asked questions such as, related to any harassment that they may be facing or deadlines at work place affecting their family lives adversely. Workers reported that they did not face any harassment. By and large, they did not feel that their work load was affecting their family adversely.

General assessment of working conditions: We assessed general working conditions in the zones by asking various questions on workers' health status. Our results are summarized in Table 20.

Table 20: Health conditions of SEZ workers: Workers' responses

Health related problems	Respondents
Stressed/ harassed due to deadlines (no.)	10
Developed any chronic health problem (no.)	3
Workers reporting health problems as a % of total workers (229)	6.5

Source: Labour Survey conducted by the author

Though working conditions appeared to be good, some workers did report problems. Some workers have been working for long time (almost 15 years in some cases) but are not regularized. Some have complained of weak bargaining power, delays in salary, unfriendly atmosphere, lack of public transport in the zone and long working hours. Some workers complained about the low salary. Interestingly, most such grievances have been from the Noida zone.

We asked workers why they joined the zones. Most these workers cited that better working conditions and higher salary were the factors for joining the zones. We then asked them to assess how satisfied they were on a 6-point scale with the working conditions in the zones. Their responses as presented in Table 21 suggest that while 35.4 per cent feel most satisfied and very satisfied), 59 per cent (135 workers) are satisfied/somewhat satisfied. Only 13 workers (5.7 per cent) are dissatisfied. In terms of the satisfaction level, SEEPZ scores over the other zones. It is followed by Madras and then Noida.

Table 21: Satisfaction level of SEZ workers with working conditions (per cent of total)

	SEEPZ	Noida	Madras	Overall
most satisfied	16	2.5	0	6.1
very satisfied	42.7	29.1	16	29.3
satisfied	36	34.2	69.3	46.3
somewhat satisfied	5.3	22.8	9.3	12.7
dissatisfied	0	6.3	1.3	2.6
totally dissatisfied	0	5.1	4	3.1

Source: Labour Survey conducted by the author

4.1.7 Bargaining Power of Labour

Freedom of association and collective bargaining are necessary rights to counter-balance the market power of employers and to enhance labour market competition. Collective bargaining, by allowing a more equal sharing of benefits, can help to improve working conditions and enhance productivity and earnings. This, in turn, contributes to overall human development, which is the ultimate objective of employment. We examine here unionization of labour, grievance redressal system, and labour relations as the indicators of bargaining power of labour.

Unionization of labour: In India, all labour laws of the land are applicable to SEZs including the right to form trade unions. However there are reports that the authorities in collusion with the factory management suppress this movement. An all-India Convention of SEZ/ SEZ workers was organized by the Centre for Indian Trade Unions (CITU) in 2002 at Visakhapatnam. This was the first ever effort by a trade union to develop a nationwide coordinated movement of the workers in the SEZs in the country. Around 100 workers employed in the Cochin Special Economic Zone, Madras Export Processing Zone and Visakhapatnam Export Processing Zone participated in the Convention. However this movement did not catch on to give any decisive direction.

We asked the management if workers in their units were organized in labour unions. Only one firm in Noida reported that it had an internal labour union. No external labour union appeared to exist in the zone. In Madras also, sample firms were not aware of any trade union. In SEEPZ, however, 6 firms reported that they had labour unions affiliated with national trade unions. Two firms had only internal labour unions.

We asked workers whether trade unions existed in the zone and whether they were members of the trade unions. Response was affirmative only in SEEPZ where 29 workers reported the presence of a labour union though only five of them reported that they were members of the union. We asked if they were dissuaded to form trade unions. Only one worker in Madras reported harassment. None of the other workers across the three zones reported any such pressure.

It is instructive to note that bargaining power is not determined by the presence of labour unions, in particular in the export sector, which has been subject to fierce international competition. It is primarily contingent upon the demand and supply factors. Thus, the more successful the zone is, the greater is the demand for labour, and hence the better is the employees' bargaining power. This could be one of the reasons why workers in Madras SEZ and SEEPZ SEZ (which are in the fastest growing states) have better bargaining power as compared with Noida, which is located in UP where the problem of unemployment is rampant. In Madras, entrepreneurs reported the scarcity of labour in the region. They informed that they were offering several facilities to motivate workers to join the SEZ job. In Vishakhapatnam on the other hand, two major strikes induced by labour unions in recent years failed due to high unemployment conditions. Some workers lost their jobs and did not get job even outside the zone (based on our own interviews).

Furthermore, it is noticed that, in SEZ units there is a high level of concentration of native workers, who are drawn from the adjoining areas (Table 22). The manner in which labourers are

Table 22: Distribution of workers by native language and place (Per cent.)

		Female	Male	Total	no information
Madras	Native language speaking	86	89	88	
	Residents prior to SEZ job	58	76	68	0
SEEPZ	Native language speaking	83	54	63	21
	Residents prior to SEZ job	91	77	81	0
NOIDA	Native language speaking	50	36	38	35
	Residents of adjoining areas prior to SEZ job	70	55	57	0

Source : 'Labour survey' conducted by the author.

recruited explains this concentration. Our survey of entrepreneurs reveals that the most popular mode of information is publicity through word of mouth. Workers are informed about the vacancies so that they can bring their friends and relatives to fill up a vacancy. Hoardings, posters and internet are also used but very infrequently. The workers' survey also revealed that networking among family members, relatives, friends, neighbours and acquaintances from the same district plays an important role. More than 67 per cent of the workers had been informed about vacancy through this networking. Media advertisement was the source of information for 18 per cent of the labour. Very few workers interviewed by us had been approached through labour agency.

As expected, one major result of this system is that the majority of the workforce is constituted by workers from the adjoining areas who share ethnic, racial and spatial bonding, which enhances their bargaining power¹³. It results in greater interactions, unity, and information exchanges among workers and strengthens their bargaining power. This aspect has received scant scholarly attention from economists and needs further research. Smith and Pun (2006) have shown how by working and living together, workers in Shenzhen SEZ in China are able to develop collective resources that can be mobilized against managerial prerogatives, and challenge what is structurally a weak employment relationship for labour.

Grievance Redressal System: We asked the management if they have instituted any system for grievance redressal in their factory. We also asked the sample workers if they have any such system in place. Our findings are as follows.

- One, there is no institution in place to address labour problems. Only three firms in SEEPZ reported that they have committees to monitor labour problems. One firm reported to have a human resource management department to address such problems. The use of complaint box is also

¹³ The system also has some adverse effects. For instance, those who do not have such networks are pushed to poorly paid jobs. In such cases the emancipatory effect of migration is reduced.

reported in SEEPZ. In all other cases, meetings with department managers appeared to be the only mechanism of labour-management engagement.

- Two, meetings for discussing performance and training are more frequently followed than for discussing labour grievances.
- Three, there have been inter-zone variations. Such meetings are more common in SEEPZ and Madras as compared with Noida.

Table 23 provides the satisfaction level of the workers with grievance redressal system. Workers in SEEPZ seem to be most satisfied with the system (75 per cent) followed by Madras (67 per cent). Workers in Noida are comparatively less satisfied (54 per cent). They feel that the system is ‘somewhat effective’ but not ‘highly effective’ in addressing their problems.

Table 23: Satisfaction level of workers’ with grievance redressal system (Percent)

	Noida	SEEPZ	Madras
Most satisfactory	2.5	8.0	0.0
Very satisfactory	21.5	40.0	5.3
Satisfactory	30.4	26.7	61.3
Somewhat satisfactory	34.5	24.0	18.7
Unsatisfactory	8.9	1.3	1.3
Totally unsatisfactory	1.5	0.0	13.3

Source : ‘Labour survey’ conducted by the author

Labour Relations: To assess labour relations in SEZs, we asked the entrepreneurs whether they faced strikes, disputes, agitation/threat of strikes by labour. Our investigation revealed that such problems were quite infrequent in SEZs. Though some firms reported labour disputes, strikes or agitations did not appear to be usual. All of them admitted that man-days lost on account of such disputes were very low.

In our sample, twenty entrepreneurs who had factories in the zones also had units operating outside the zones. We asked them to compare labour problems in the zones and the rest of the economy. Their responses are summarized in Table 24. While the majority feels that labour discipline (including labour turnover) is much better in the zones, they do not find labour laws relaxed in the zones.

Table 24: Labour conditions in the zones: Managers responses (per cent)

	Much better	Slightly better	No difference
Labour disputes	50	20	30
Labour discipline	50	12	38
Flexibility in hiring and firing	15	20	65
Flexibility in labour laws	20	15	65
Labour cost	20	20	60
Labour turnover	42	20	38

Source : ‘Enterprise survey’ conducted by the author

Undoubtedly, trade unions are non-existent/weak and strikes are rare in India's SEZs. However, this does not appear to have resulted in lower wages and poor working conditions. This could partly be due to market forces but primarily due to the fact that plants of different level of technology and skill sophistication co exist in Indian SEZs. Generally, it is expected that workers' wages and working conditions are better in the plants devoted to high skilled operations and better treatment spills over into less sophisticated plants as well.

4.1.8 Living Conditions

Various indicators of living conditions have been used to analyse how employment in the SEZ sector can influence the living conditions of workers. These are housing, sanitation conditions, availability of potable water, health conditions, transportation etc.

Housing: Our survey reveals that employers do not provide accommodation to workers. There is no provision for hostel or dormitories. Only 2 of the 225 workers surveyed said that they were living within the company premises. One of them was a security guard while the other was a helper. As discussed earlier, most workers are drawn from the adjoining areas or are migrants already settled here. Since the SEZ job does not ensure them any accommodation, it does not affect the amount that they pay for housing. They thus continue to pay the market charges for their accommodation, which may be substantial.

However we do find evidence of improvement in the living standard of workers after joining the SEZ (25). Number of workers living in Kutcha houses declined from 43 to 34 while those living in pucca houses increased from 168 to 182. The improvement is more noticeable in the housing status of male workers than that of female workers. Most female were already living in pucca houses.

Table 25: Living conditions before and after joining the zones (No. of workers)

	Prior to joining zone			After joining SEZ		
	<i>F</i>	<i>M</i>	<i>Total</i>	<i>F</i>	<i>M</i>	<i>Total</i>
Gender						
Kutcha house	16	27	43 (20.3)	15	18	33 (15.3)
Pucca house	50	118	168 (79.6)	52	130	182 (84.6)
Access to sanitary facilities	49	139	188 (82.1)	55	148	203 (88.6)
Access to safe drinking water	58	151	209 (91.3)	64	155	219 (95.6)
Access to Electricity	58	153	211 (92.1)	61	155	216 (94.3)

Note: Figures in parentheses show percentage of total

Our analysis also indicates that SEZ employment has improved access to sanitation conditions, safe drinking water and electricity. Though the changes are not substantial, they do indicate improvement in the living conditions of the workers.

Transport: For many low-wage workers, the issue of transportation is of paramount importance. In general SEZs are established at the periphery of the cities. Since the majority of the poor live in the inner cities it is possible that they are structurally de-linked from the SEZs, which means that high transport costs may reduce their already low incomes leaving them with little savings. We examined whether companies provide such facilities to workers in India (Table 26). Managers from 52 companies (70 per cent) reported that they provided transport facilities to workers. While most firms arrange vans/buses to ferry workers, others offer allowances. Inter-zone variations are however noticeable. While such facilities are common in SEEPZ, Noida is far behind. In SEEPZ, over 70 per cent of workers reported that company buses ferry them, less than one-fourth of the workers are travelling by company buses in Noida.

Table 26: Transport Facilities to zone workers (No. of companies)

	Van/bus	Allowance
Madras	16	2
SEEPZ	21	1
Noida	7	2

Source : 'Labour Survey conducted by the author.'

Health conditions: Health status of workers improved and they seem to have become health conscious. This is evident from the findings reported in Table 27, which suggests that a large proportion of the workers did not suffer from any illness during the month prior to the survey and did not avail sick leave. This reflects that workers can now afford to buy better food and avail of better treatment, which has a positive impact on their health. It is also a reflection of congenial working condition and better access to doctors. The point that SEZ employment is remunerative and results in human development need not be overemphasised.

Table 27: Health records of workers

No. of sick leaves	No of workers	Per cent of total respondents
0	69	35.0
< 12	103	52.3
12-24	19	9.6
>24	6	3.0

Source : 'Labour Survey conducted by the author'

Attrition: We also examined labour attrition in the zones. For this, we sought the perspective of the managers. Information collected from managers is compiled in Table 28. Managers were asked to rank labour attrition for different categories of workers on the scale of 0 to 3. Most entrepreneurs reported attrition levels to be low to medium in most categories. In the case of the most vulnerable category of unskilled

labour it is comparatively higher. However, the evidence suggests that the attrition rates are lower among female workers.

Table 28: Attrition rates: Managers’ perspective (per cent of responses)

	No attrition	Low	Medium	High
Manager (male)	16.2	55.4	27	1.4
Manager Female	16.1	57.1	26.8	
Supervisor Male	9.5	58.1	27	5.4
Supervisor female	8.6	58.6	27.7	5.2
Clerical male	6.8	54.8	35.6	2.7
Clerical female	13.8	55.2	29.3	1.7
Skilled male	5.5	49.3	34.8	10.9
Skilled F	6.5	54.8	32.3	6.4
Unskilled male	5.2	37.8	29.2	28.1
Unskilled female	8.1	48.4	30.6	12.9

Source: ‘Enterprise survey’ conducted for the study

Overall assessment of living conditions: Finally, we directly asked the workers if their living conditions had improved after joining the zone. Sixty-one per cent of labourers felt that their living standards have improved. Female workers appeared to be more satisfied. Over 70 per cent of female workers reported that their living conditions were better after joining the zones. On the other hand 56 per cent of male workers also reported improvement in their living standards.

4.2 Human Capital Formation Effects

One of the important by-products of SEZs is human capital formation or skill upgradation. This goal is truly realized only if zone units provide additional training on- and off- the job. The following analysis focuses on training of labour, incentive systems and entrepreneurial upgradation effects.

4.2.1 Labour Training

Entrepreneurs’ perspective: Responses of the unit management suggests that almost two third of the sampled firms provide formal training to workers at all levels (Table 29).

Table 29: Training for workers in the zone (No. of firms)

Category	Yes	No	Sometimes
Managers	43	28	4
Supervisors	45	28	2
Production Labour			
Skilled	49	25	1
Unskilled	45	29	1

Source: ‘Enterprise survey’ conducted by the author

Table 30 shows modes of training adopted by various firms. It is found that in some cases, workers in SEZs receive more substantial training but this is typically restricted to the higher end of skills. For example, MNCs sometimes send local employees abroad for higher management training and advanced technical courses. But this tends to be on a small scale. Only 3 units have reported that they sent the executives for

Table 30: Modes of training (No. of firms)

Mode of Training	Yes	Sometimes
Send employees to foreign countries	3	5
External staff used for in-house	14	4
Foreign technicians visited the company	7	12
Staff with training responsibilities on payroll	19	2
A separate training department	11	1

Source : 'Enterprise survey' conducted by the author

training abroad. In most cases training is imparted in-house. While some firms have separate training departments, others have staff on payroll for imparting training. There is also evidence that foreign technicians are invited for training the workers. Training is mostly task-specific and geared to enhancing productivity and efficiency in the firm's operation. The form (on- or off- the job), mode and the time length of training depends on the skill component of the economic activity. We witnessed rigorous training schedules in high tech and high skill intensive companies. In SEEPZ, some gems and jewellery units have collectively started training programmes. Some of them reported having set up their institutes for designing and executing complex operations.

The workers' perspective: While almost 66 per cent of the companies surveyed reported the existence of formal training programmes, 124 of total 229 labourers (that is, only 54 per cent) reported that they had undergone any formal training. 70 per cent of female workers reported that they acquired training while only 47 per cent of the male workers reported the same. We compared the status of training in the zone with that outside the zones. We asked those workers who had previously worked outside the zone whether they were given formal training. We found that only 30 per cent of them had been given formal training outside the zone. Over 46 per cent of these workers were given training when they joined the zone job. These findings suggest that the incidence of training was relatively higher in the zones as compared with that outside the zone (though it was lower than what the entrepreneurs reported). This could be due to a greater need for specialization and quality control.

It is generally argued in the literature that such training is of short duration and covers assembly type of activities. Due to job specific training, workers' skill-sets and their chances of getting better jobs are not enhanced. We asked the labour whether they have better job prospects outside the zone after working here. According to the responses, 153 of 229 (67 per cent) feel that their job prospects are now better. Workers feel that even without any formal training their chances of getting better jobs improve due to their zone experience. It clearly speaks high of working in SEZs.

4.2.2 Incentive Systems

Human capital formation is not simply about raising the general level of education/technical and employability skills. It is about creating dynamics in the economy which motivate the workers to continuously upgrade their performance and skills and identify their interests with the interests of the company. The Human Resource Management literature (Boning *et. al.* 2001; Black and Lynch 2003) suggests that incentive-based compensation plans such as bonuses and rewards and work place innovations such as offering the career growth graph or the performance–development graph to employees, play an important role in motivating workers to upgrade themselves. In addition, such compensation plans give non-managerial workers an incentive to come forward with ideas that would improve the production process and promote their creativity. We therefore examined the incentive mechanisms used by the factories to motivate workers to perform better and upgrade themselves. The results are summarized the Table 31.

Table 31: Incentive systems offered by the factories in selected zones (No. of firms)

	Yes	Sometime	Not available
Performance based increments	66	-	9
Time bound increments	59	1	15
Rewards	45	6	24
Career growth curve	18	5	52
Performance linked career development	21	3	51

Source : 'Enterprise survey' conducted by the author

Over 88 per cent of firms link increments with performance. Very few firms reported only time bound promotions. Almost all of them have adopted appraisal-based time bound promotion systems. In a large number of firms financial rewards are also offered to workers for their performance. However very rarely are employees given career development plan or growth plan, which has emerged as an important mechanism of human development in this era of globalization.

Job Satisfaction: We asked workers whether their jobs responsibilities were commensurate with their education/skills in the zone (Table 32). For a comparative analysis we also asked them whether they were satisfied with the job profile when they were previously employed outside the zone.

Table 32: Satisfaction level of the workers with job profile (per cent of total)

	per cent of those who find job profile commensurate with the skills		per cent of those who have job satisfaction	
	<i>Only those who previously worked outside the zones</i>	<i>Overall sample</i>	<i>Only those who previously worked outside the zones</i>	<i>over all</i>
In current job for female	100	82.9	100	80
In previous job (female)	54.1	n.a.	50	n.a.
In current job (male)	75.3	73.6	75	65
In previous job (male)	60.2	n.a.	27.1	n.a.

Source: 'Labour survey' conducted by the author

Our analysis suggests that a higher proportions are workers are satisfied with the job profile offered in the zones. Workers who have previously worked outside the zones feel even more satisfied now in the zones.

4.3 Zones and Technology Management

In a globalizing economy, continuous improvement in product, process, technology and organization have become the keys to sustained competitiveness. Firms, in particular SMEs, are under tremendous pressure to innovate and restructure their operations to achieve efficiencies in production. But they often lack the resources to do so. SEZs create favourable conditions for technology transfers and learning for these firms not only by promoting interactions, inter-linkages and economies of scale but also by facilitating the insertion of these firms into global supply chains. It is therefore believed that SEZs are of particular interest to developing countries. During our visit to the zones, it was revealed that most firms have production and marketing tie ups abroad and hence are part of the global chain.

In this section we shall examine the role of SEZs in facilitating technology flows. While doing so, we shall begin by examining the importance of technology in determining the competitiveness of SEZ units in India. This will be followed by an analysis of technology transfers, generation, and upgradation.

4.3.1 Role of Technology in SEZs

In India's zones low medium and high tech sectors co exist, as has been suggested above. To gauge the technological sophistication of economic activities in these sectors, we asked the managers how frequently technology changes take place in their area of production. Their response was measured on 1 to 3 scale. 1 is referred to low-, 2 to medium- and 3 to high-rate of change. Summary information is compiled in the form of an index with '2' as the base which represents average on our scale (Table 33). If the index value is 100 then the sector is dominated by medium tech activities. The smaller the value, the lower is the technology intensity of sector and vice versa. The results show that the index value is close to 100 in almost all the sectors which means that SEZs are dominated by economic activities of medium technology.

Table 33: Technology intensity of economic activities in the zones by sector

Sector	Technology index with base=2
Chemical	100
Miscellaneous	90
Engineering products	110
Textiles	100
Pharmaceutical	120
Gems and jewellery	100
Electronics	105
Rubber and plastics	115
Over all	105

Source: 'Enterprise survey' conducted by the author

We then asked the entrepreneurs how important are technology and other cost related factors in determining their competitiveness. The objective was to examine the

perception of entrepreneurs regarding technology upgradation. Technology related factors were captured by technology used, quality of product and scale of production while cost factors were : cheap labour, cheap raw material, and finance charges. Their response was again measured on a scale of 1 to 3. For each sector, the mean response was calculated and was deflated by 2 (and multiplied by 100) for examining the deviation from the medium response (Table 34). The statistics revealed that cost related factors are generally rated below average while technology related factors are rated above average in all the sectors. Among technology related variables, quality is considered to be the most important determinant of competitiveness followed by technology used. Technological capabilities are therefore expected to play an important role in determining firms' competitiveness in SEZs in India.

Table 34: Contribution of selected factors to firms' competitiveness in the zones

Sector	Cheap labour	Raw material	Finance charges	Technology used	Quality of product	Scale of production
Chemical	80	90	80	90	130	130
Miscellaneous	75	95	95	95	125	100
Engineering products	90	100	90	100	100	90
Textiles	100	100	90	110	130	120
Pharmaceutical	100	110	100	120	120	110
Gems and jewellery	95	80	85	125	140	105
Electronics	80	90	85	125	140	125
Rubber and Plastic	100	100	100	135	150	115
Sectoral average	90	95	90	110	130	110

Source: 'Enterprise survey' conducted by the author.

4.3.2 Technology Transfers

As discussed earlier, technology transfers take place in three different ways: foreign direct investment, arms' length licensing (including technical consultancy) and acquisition of capital goods. In what follows we analyse the extent of technology transfers in Indian zones through the three modes of technology transfers.

Direct investment: Literature suggests that FDI is a means for allowing developing countries to acquire the most advanced production technologies as also for infusion of organizational and managerial skills. We therefore assessed the presence of foreign investors in Indian zones.

Table 35: Share of FDI in total SEZ investment in 2003: (per cent)

	India
Noida	19.9
Madras	35.0
SEEPZ	19.2
Cochin	20.1
Kandla	8.1
Falta	6.3
Vishakhapatnam	40.0
Surat	0.0
Total	24.5

Sources : Ministry of Commerce, Government of India

Table 35 shows that as of now, SEZs in India have been dominated by domestic investment. The share of FDI in total investment increased slowly from 12 per cent in 1989 to slightly over 18 per cent in 2000. During 2000-2003, FDI inflows increased faster. However it still remains around one fourth of total investment in the zone.

We also examined the nature of technology used by multinational enterprises (MNEs) vis-à-vis domestic firms. We asked the firms to rank the vintage of technology that they were using on a three point scale. Interestingly the mean response was almost the same for MNEs and their domestic counterparts (2.25 and 2.2). This indicates albeit weakly that technologies used by foreign firms are not significantly superior to those used by domestic firms. It could be that high level knowledge transfers tend to be strictly controlled by the foreign partner, or restricted or even prohibited. In China too a number of empirical works highlight the fact that in many cases foreign affiliates of western MNCs are locked in low value-added productions (Lemoine and Ünual-Kesenci, 2004). An investigation on a sample of FDI enterprises in one of the fourteen Economic and Development Zones set up by the Chinese government in 1984 in Dalian brought to the fore that about one-sixth of them did not bring from abroad any new products or equipment (Lan and Young 1996).

This is not peculiar to the zone sector alone but is an observed phenomenon in the rest of the economy as well. In a recent study, Bhaumik et al (2003) observed that most MNEs are not carrying out R&D operations in India and that the extent of training provided to local employees is not significant. Praussello (2005) argued that contribution of MNCs' in upgrading technological standards in developing countries is not significant.

Technology Imports: Technology imports are formalised through payments and contracts. Many scholars argue that technology imports have been the most important factor in explaining the rapid economic growth of Japan, Taiwan, South Korea, and other newly industrialized countries. While examining the importance of technology imports in the zones, we asked firms whether they imported technology. Of the 75 firms, 36 informed that they used licensed technology. However, sectoral variations were observed. While 75 per cent of pharmaceutical and textile sector units have reported licensing arrangements, only 25 per cent units in the chemical, rubber and plastics and other sectors have been using imported technologies. The average share of units importing technologies in electronics, engineering, and gems and jewellery is 50 per cent (Table 36).

Table 36: Incidence of technology licensing in zones by sector

Sector	Reporting firms	Total number of firms	Per cent firms importing technology
Pharmaceutical	4	5	80.0
Textiles/garment	4	5	80.0
Chemicals	1	4	25.0
Electronics	7	15	46.7
Engineering products	5	12	41.7
Gems and jewellery	11	20	55.0
Miscellaneous	3	10	30.0
Plastic	1	4	25.0
Total	36	75	48.0

Source: 'Enterprise survey'

Our investigations revealed that a majority of firms that are importing technologies update the technology on continuous basis. For cross examining them, we asked if they have made any technology related payments during the last three years, 34 responded positively. Thus, technology transfers through licensing arrangements are relatively more common in the zones.

Capital goods acquisition: The most popular mode of technology imports in SEZs turns out to be the use of imported machinery. Most firms (83 per cent) were updating their technology through imports of machinery. We asked them the age of their latest machinery. Of the 75 sampled firms, 67 responded. The summary information is provided in Table 37. For most firms it is one year or less.

Table 37: Distribution of the vintage of latest machinery

Vintage of latest machinery	No. of firms
Less than a year	21
One year	23
1-2	9
2-3	7
More than 3 years	6

Source: 'Enterprise survey'

Technology transfer in embodied form is the most common form of technology transfer even outside the zone sector. In a study on the determinants of export competitiveness in Indian industry, Aggarwal (2002) found a strong relationship between imports of technology and export performance of non-SEZ firms in low and medium tech industries in India. It was argued that in such industries technologies are widely diffused and are mainly embodied in capital goods. Thus the behaviour of zone firms reflects the general behaviour of firms in the domestic economy.

In sum, the patterns of technology transfers and their relationships with exports in the zones may not be very different from the rest of the economy. Just as in the domestic economy, technology imports occur mainly through capital goods imports followed by technology licensing. However, these can no way be said to be leading the economy towards technological dynamism.

4.3.3 Technology Creation

Technology transfers alone do not help in building technological capabilities. For assimilation and adoption of imported technology, a well developed in-house R&D capabilities is essential. It is therefore important to analyse the R&D activities within the units. We asked several questions relating to R&D activities performed by the units. Our findings are as follows:

- R&D activities are clearly and formally articulated with the enterprise strategy in most cases. As a result, many SEZ units have separate R&D departments. About 60 per cent of the firms reported that they have employed R&D personnel and most firms reported to have incurred R&D expenditure. But in most cases investing in R&D is below the threshold of 1 per cent of their turnover.
- R&D activities centred on minor innovations, modification or improvement of existing technologies and designing. Much of the R&D spending is incurred towards quality control.
- Only a few firms could forge ‘linkages’ with technological institutions, academic institutions and R&D units of other firms. Seven firms reported that they have links with government institutions. Only five firms have such links with private R&D institutions and two with academic institutions. Foreign firms seem to enjoy access to their parent R&D labs.
- Use of ‘information technology’ in production is limited. Only four firms reported that they were ‘computerised machines (CNC) in production. Most firms are using IT in accounting or payrolls.

These findings are quite consistent with the R&D behaviour of export oriented firms outside the zones. Kumar and Aggarwal (2005) analysed R&D expenditures of over 600 R&D performing firms. They found that there is a significant relationship between R&D intensity and export orientation. In another survey (conducted for Kumar and Aggarwal 2000), they asked firms (outside the zone) to rank the various types of R&D activities according to their importance in their unit on a 1 to 5 scale. It was found that a majority of firms were still focusing on quality control and adaptation of imported technologies.

What is of concern is that firms have no orientation for fundamental research. Our visits to the zones revealed that R&D is an important component in their export strategy. Some firms have even developed significant R&D capabilities of their own. For instance, during our informal interviews at Cochin SEZ, we found that one firm was even doing contractual R&D on order from the US based company. However, such examples are not common. Zones are dominated by medium tech activities, and technology transfers and in-house R&D activities and technology activities of SEZ firms are not significantly different from non-SEZ export oriented firms.

5. Indirect Effects

SEZs generate indirect effects through the creation of backward and forward linkages with the rest of the economy. Due to lack of quantitative database, it is not possible to precisely evaluate the indirect effects of zones. One can however assess the potential of zones in generating indirect effects by looking at the factors that determine it. One such factor is the degree of value addition. It is defined as the net exports (exports minus imports) as a percentage of total exports. Sector-wise value addition figures are provided in Table 38.

Table 38: Sector-wise Value addition in SEZs: 2000-05

Sector	Net exports as percent of total exports
Chemicals & drugs	71.6
Electronics HW	20.4
Electronics SW	87.2
Engineering	43.9
Food	88.0
Gems & Jewellery	38.2
Leather	75.8
Rubber/Plastics	65.7
Textiles	60.6
Misc	64.0
Total	48.1

Source: Calculations based on the data collected from Development Commissioners' offices

One can observe that value addition in India's SEZs compares favourably with SEZs of many other countries that have been successful in establishing backward economic linkages. These are for instance, South Korea, Indonesia and Taiwan where value addition in the early 1990s, had been 53.2 per cent, 62 per cent, and 49 per cent respectively (Amirahmadi and Wu 1995).

Value addition is a good measure of the extent of economic activities and incomes generated within the zones as also for indicating the indirect employment generation potential of SEZs. It may not however be a measure of knowledge and technology spill-overs which depend on the local sourcing of inputs and sales in domestic tariff areas (DTA sales). Unfortunately the data on these indicators was not readily available. We procured this information from the zone authorities and summarised it in Table 39. It shows that the domestic input content and DTA sales, both are rather

Table 39: Backward linkages in zones (per cent)

zone	Procurement to total imports into the zones	Ratio of DTA sales to exports
CSEZ	19.8	1.8
FSEZ	54.1	17.8
KASEZ	38.5	9.8
MEPZ	16.5	1.6
NEPZ	4.9	1.2
SEEPZ	1.1	0.1
VSEZ	0.4	1.0
Average	8.7	

Source: Calculations based on the data collected from Development Commissioners' offices

small in India's SEZs with Kandla and Falta being the only exceptions¹⁴. But nevertheless, it does not mean that the SEZs are isolated enclaves with little spill-over effects. Significant spill-overs to the domestic economy are expected to take place through demonstration effects and labour turnover. These spill overs take place when

- labour moves to non SEZ areas,
- SEZ entrepreneurs set up units in the domestic mainland, and
- SEZ entrepreneurs interact with other SEZ producers and domestic mainland entrepreneurs in various forums such as trade bodies, business chambers and export promotion councils.

Over 27 per cent had units in our sample had units in domestic tariff areas as well. Furthermore, all the units are associated with business chambers, export promotion councils and trade bodies. Thus the possibility of knowledge and technology spill-overs and hence learning and knowledge acquisition cannot be ruled out.

6. Conclusion and Policy Implications

Three major conclusions emerge from the analysis. These are as under.

- (1) Employment generation, both direct and indirect, has thus far been the most important channel, through which SEZs have impacted on human development and poverty reduction in India. India's SEZs are not dominated by assembly type operations. 'Value addition' component and hence employment generation potential of zones is rather large. Even though their contribution to national employment has been rather limited, they have contributed significantly to employment generation at the regional level. Due to stagnation, their ability to absorb surplus labor has been declining. This is manifested in the declining employment elasticity of exports. It can only be reversed if fresh investment is attracted to SEZs. With the SEZ Act in place, there has been a surge in the establishment of new zones, which is likely to generate huge employment potential in the economy. Much of this will be a net addition to employment as investment relocation/diversion in export oriented production is likely to be limited.

Zones have proven to be particularly beneficial to female employment. SEZs have opened up opportunities for wage employment for women in the formal sector, thereby increasing their employability as well as improving their position in the household. This is an important contribution of zones because female employment is crucial for equitable growth. Most critics suggest that employment is feminized in the zones and that these women are young and can easily be exploited. However, the analysis of socio economic status and working conditions of female workers undertaken in the study finds little evidence to support these hypotheses.

There is a wide consensus on the central role of employment in poverty reduction. One is therefore tempted to conclude that zones can be used as an

¹⁴Domestic procurement and domestic sales are relatively large in Kandla and Falta zones due to trading activities in used plastics in Falta and used textile and other products in Kandla.

effective policy instrument in alleviating poverty. However, the relationship between poverty and employment lies in the extent to which income generated from employment permits workers and their dependants to obtain goods and services necessary to meet minimum needs. Poverty reduction thus calls for the creation of remunerative, regular and good-quality jobs in the labour market. Our analysis suggests that wages in the zones are not lower than those prevailing outside the zones, in particular in the small/informal sector. Working conditions in the zones in terms of social security benefits, transport facilities, health facilities, food facilities, working environment and working space, are also better than those in the same types of jobs in the rest of the economy. This has had a direct effect on the standard of living of workers. SEZs, if promoted vigorously can therefore act as an initiator in the process of human development and poverty alleviation in India.

- (2) The role of SEZs in human capital formation appears to be relatively limited. Most SEZ units impart on-the-job training to their workers. But training is focused, employer-driven and lasts for short durations. Most workers feel that this training does not upgrade their skills substantially. Nevertheless, they feel that they are exposed to learning by working under strict time schedules, high quality standards and sophisticated machinery. This learning helps in upgrading their capability of learning further. Skill begets skill through a skill multiplier process and ensures higher returns. Workers also feel that their job prospects outside the zone have improved due to their working in SEZs. When workers move out of the zones to domestic economy, skill spill-overs take place in the rest of the economy as well. New zones that are attracting second and third generation firms are expected to enhance the role of SEZs in human capital formation by creating demand for new set of skills and by imparting substantial training to workers for handling highly skill intensive operations.
- (3) Zones' contribution as an engine for promoting new knowledge, technologies and innovations through technology transfers and technology creation has however been quite limited till now. Zones are dominated by medium tech activities and most firms are involved in contract manufacturing, which leaves little scope for R&D activities. It is found that the technology-related activities of the SEZ units are not different from those of the export oriented domestic units outside SEZs. The zones thus could not fulfil the role of promoting innovation systems in the economy. This is despite the fact that the knowledge spill-over potential of zones is rather high in the economy. Most entrepreneurs are educated and run their businesses professionally. Besides, many of them have units outside the zones as well. It is also observed that most zones have formed manufacturers' associations. They are also members of other manufacturers' associations. SEZs are thus not working in isolation and are well connected with the domestic economy. Perhaps a micro/sector based study could indicate some success stories.

The following are policy insights or implications that we draw from the analysis.

- (1) The foregoing analysis suggests that Indian zones have the potential for generating direct and indirect effects and that they can be used as an effective

policy instrument in promoting employment and human capital and alleviating poverty in this country. Past government policies however did not allow the realization of full potential of SEZs. The effects of SEZs are contingent upon the success of the zones in attracting investment, in particular, FDI. But in the absence of a comprehensive policy framework, investment in the zones remained laggard until recently. The share of FDI remained miniscule in comparison with neighbouring countries (Aggarwal 2006). The SEZ policy underwent gradual relaxation of procedural and operational rigidities. Policy changes remained slow and extremely cautious. The SEZ Act is expected to have an overwhelming bearing on the SEZ performance in the country. It is unfortunate that the public opinion has turned highly unfavourable to the policy. This reveals the government's inability to implement the policy effectively. The frequent and ad hoc amendments that it has been incorporating in the policy in the wake of criticism heaped at it, may create uncertainty in the minds of investors that in turn will have disastrous consequences. It is crucial to develop a clear and comprehensive strategy to deal with the subsidiary issues that have emerged recently.

- (2) While the wages and other benefits offered by SEZs are better than those outside the zones, the bargaining power of SEZ workers remains weak due to limited trade union activity. As a result, attitude of the management towards labour becomes the deciding factor in determining the wage rate, workers' rights and work environment in SEZs. Proactive government policies may therefore play a crucial role in this regard. Government intervention may be engaged at various levels. The government needs to ensure the implementation of labour standards, conditions of work, and health and safety standards, and the creation of support infrastructure for education and training of labour. It is also important to promote management- labour councils in SEZ units as an effective means of developing sound labour relations in SEZs.
- (3) With new generation SEZs emerging, the scope of human capital formation and technology upgrading effects will widen. It is therefore important for the government to play a pro active role in strengthening these effects. There are weak to missing linkages between the various actors (government, university, industry) necessary to stimulate a culture of learning and innovation, especially where individual R&D capabilities are lacking. Effective measures need to be taken to create R&D infrastructure, forge linkages between institutions, universities, and the SEZ units and to promote R&D funding. Most advocates of the development process consider education and acquisition of skills to be the most important weapon in the fight against poverty in the current era. It is argued that the productivity of labour forces in developing countries has failed to improve primarily due to the fact that work forces in these countries are uncompetitive and lack the required skills. In this scenario, SEZs can be used as a policy instrument in upgrading skills and building human capital
- (4) For the contribution of SEZs to various aspects of human development to be realised, it is important to forge linkages between the domestic economy and SEZs. Systematic efforts need to be made to help zone units forge links with the outside units. Most units are into cost cutting by way of procuring inputs

from local sources. The government has also, in the new SEZ policy, relaxed the procedures for purchasing inputs from outside the zones. However, rules relating to subcontracting also need to be standardized. As of now, firms find it difficult to get job work done outside the zone. Most firms are subcontracting within the zone. During peak seasons, it becomes difficult for the firms to maintain time schedule. Some rules may be devised to relax subcontracting norms at least during peak seasons. Similarly, many firms find DTA rules very stringent. They find that they cannot compete with local producers in domestic markets if they sell their products after paying full duty in these markets. Some relaxation may be introduced in the rules under certain exceptional circumstances. This may also generate knowledge spill-over effects.

The key objective of economic development is to maximize the positive human development and poverty impacts. SEZs have the potential to enhance human capabilities. But for this potential to be realised, the government must devise strategies to strengthen the opportunities that are likely to emerge, protect interests of the SEZ workers, and forge linkages between SEZs and the domestic economy.

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